(54) **User terminal with internal directory for storage of telephone numbers as well as an address of an external directory**

(57)   A telecommunication user terminal, such as a traditional telephone set or a mobile telephone, provided with a personal address book or internal database (PTD), e.g. located on a user's smart-card. The internal database has several memory locations (IA1, ..., IA5, ...) each storing a call reference that may be selected as calling number by a search key entered by the user on a keyboard (KB) of the telephone. The internal database further has an extra memory location (XE) that stores an extra call reference to a second database (TDS) and that is used in case no matching is found with the other call références. The second database is an external directory service controlled by an operator or service provider. The internal and external database complement one another in a transparent way for the user owing to a fall- through selection circuit (FT) also forming part of the telephone.
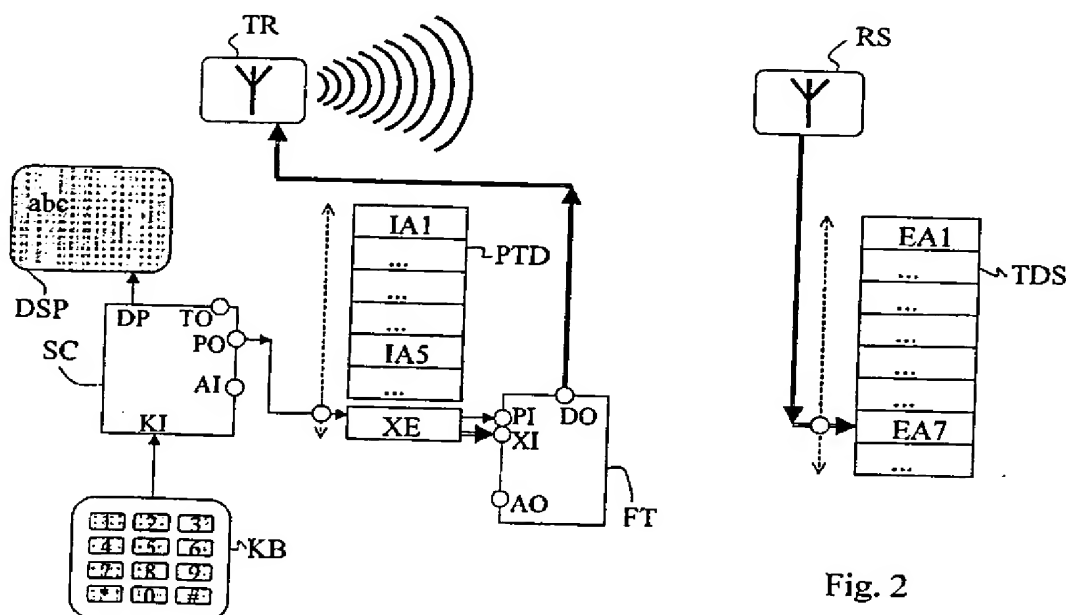
Fig. 2

Description

[0001] The present invention relates to a telecommunication user terminal including a database with a plurality of memory locations each adapted to store a call reference, said user terminal further including selection means adapted to select one of said memory locations according to a predetermined input in said user terminal and to allow a connection to be setup according to the selected call reference.

[0002] Such a telecommunication user terminal is generally known in the art. It may for instance be a typical telephone subscriber set or, preferably, a mobile telephone. The database of the user terminal is a personal telephone directory and the call references are phone numbers. Each of these phone numbers is a translation of the code, abbreviation or name dialed on the keyboard of the terminal as predetermined input. In case of a mobile telephone, the database or personal telephone directory is loaded on a smart-card inserted in the telephone. This user personal telephone directory may be combined with another personal telephone directory internal to the telephone, forming then also part of the database. This internal personal telephone directory is in fact the only one present in a fixed telephone.

[0003] When one or more alphanumeric characters are entered (dialed) in the telecommunication user terminal or after a "select" instruction, the selection means scans the database or personal telephone directory in order to find a memory location corresponding to this input. If found, the call reference contained in the pointed memory location is transmitted to the selection means. This allows the telecommunication user terminal to setup a connection to a subscriber or to an address corresponding to the selected call reference.

[0004] A problem with a database included in a telecommunication user terminal is that the amount of entries thereof is generally limited. Also the size of the memory locations is predefined and may not be exceeded. Additionally, the call references of the database have generally to be loaded and updated manually by the user. To search for information on other telephone services, e.g. in different address books or databases such as the ones provided by network operators or service providers, a special call to these services has to be setup with the goal of searching the information therein. This requires the knowledge of the references or addresses of these services in order to call them up.

[0005] An object of the present invention is to provide a telecommunication user terminal of the above known type but which has an easy and user friendly access to a database that is relatively much larger than the one included in the known telecommunication user terminal.

[0006] According to the invention, this object is achieved due to the fact that said database includes an extra memory location adapted to store an extra call reference to a second database, said second database being external to said telecommunication user terminal

and including second memory locations each adapted to store a second call reference, and that said telecommunication user terminal further includes fall-through selection means adapted to couple said selection means to said second database in order to select one of said second memory locations according to said predetermined input and to allow a connection to be setup according to the selected second call reference.

[0007] In this way, the user is provided with an easy access mechanism to a global directory service. By adding only one extra memory location, the amount of possible memory locations to select is increased by the size of the second database. Since the second database is external to the user terminal, it may be relatively much larger. Also larger (second) call references may be available. As a result, the user has an automatic and transparent access to a very large virtual database, e.g. the telephone directory service provided by a network operator. Moreover, no additional action has to be taken by the user to switch from his user and/or internal personal directory or database to the external second database when an entry, for which the user is searching, is not found in the first database.

[0008] In more detail, the present invention is characterized in that said fall-through selection means establishes a connection between said telecommunication user terminal and said second database according to said extra call reference and is adapted to recover the selected second call reference and to transmit it to said selection means.

[0009] In this way, the user has not even to know the reference for calling the second database.

[0010] Further characteristic features of the present telecommunication set are mentioned in the appended claims.

[0011] The above and other objects and features of the invention will become more apparent and the invention itself will be best understood by referring to the following description of an embodiment taken in conjunction with the accompanying drawings wherein:

  Fig. 1 schematically represents a common operation of a telecommunication user terminal with an internal database PTD according to the invention; and
  Figs. 2 to 4 represent successive steps of an operation of the user terminal of Fig. 1 for recovering a call reference from an external database TDS.

[0012] The block diagram shown at Fig. 1 schematically represents circuits of a telecommunication user terminal such as for instance a traditional telephone subscriber set or a mobile telephone, as will be described in more detail in the following example. The telephone has an input keyboard KB and a display DSP showing the alphanumeric characters, i.e. characters or digits, entered by a user on the keyboard KB. The telephone is further provided with a database PTD that is

generally implemented as personal telephone directory or address book of the user. The database PTD forms part either of the terminal itself or of a smart-card that may be inserted in the terminal. In case of a mobile telephone, the database PTD is generally constituted by a combination of these two types of memories that operate individually or that complement one another in a transparent way. Since the database PTD is internal to the telephone, its size is rather limited. Therefore, the telecommunication user terminal or telephone of the present invention is provided with a fall-through selection circuit FT, as shown at Fig. 2. As will be explained in more detail later, the fall-through selection circuit FT allows to establish a link to an external database TDS in case the searched item is not found in the internal database PTD.

[0013] The operation of the telecommunication user terminal using the internal database PTD as well as the external database TDS will be explained hereafter.

[0014] When the user is searching for a reference in a database, he enters a name, an abbreviation or a code, e.g. "abc", as search key or input on the keyboard KB. This information is transmitted from KB to an input KI of a selection circuit SC, also included in the telephone, as shown at Fig. 1. The selection circuit SC sends the search key both to the display DSP via an output DP and to the internal database PTD as a pointer PO via a like-named output. The pointer PO scans the internal database PTD in order to find therein a memory location IA1, ..., IA5, ... that contains a call reference corresponding to the search key. If such a call reference is found, say IA5 having here the same name as the corresponding memory location, it is transferred to an input AI of the selection circuit SC. The call reference IA5 is generally a calling number of a person whose name or any other reference has been entered as input on the keyboard KB and it can thus be used as such for calling this person. To this end, the call reference IA5 is transmitted via an output TO of SC towards an output circuit TR of the telephone, and so further to a telephone exchange (not shown). In case of a traditional telephone, the output circuit TR is coupled to a wall connector of the subscriber set, whilst in case of a mobile telephone the output circuit TR is the transmission circuit coupled to the antenna. The output circuit TR will however not be described in more detail hereafter because it is well known by any person skilled in the art.

[0015] In case no matching call reference is found in the memory locations IA1, ..., IA5, ... of the database PTD, the pointer PO drops automatically to an extra memory location XE of this database PTD. As shown at Fig. 2, the contains XE of the like-named extra memory location is then transferred to an input XI of a fall-through selection circuit FT, also included in the telephone. The pointer PO itself is also transferred to the fall-through selection circuit FT via an input PI thereof. The fall-through selection circuit FT uses the call reference XE as calling number for an external database TDS by pro-

viding it to the output circuit TR of the telephone via an output DO of FT. The external database TDS includes memory locations EA1, ..., EA7, ... and is coupled to a transmitter/receiver circuit RS similar to the output circuit TR of the telephone. The external database TDS operates in a similar as the internal database PTD but may be much larger since it is external to the telephone. TDS provides an enhanced telephone directory service controlled by a network operator or a service provider.

[0016] When a communication is established between the circuits TR and RS, the pointer PO is transferred to the external database TDS where it is again used as a pointer for scanning the memory locations EA1, ..., EA7, ... When a call reference matching the pointer PO is found, say EA7 having here the same name as the corresponding memory location, it is transferred to the transmitter/receiver circuit RS, as shown at Fig. 3. From RS, the call reference EA7 is transmitted to the fall-through selection circuit FT via the output circuit TR of the telephone and an input DO of FT.

[0017] Referring now to Fig. 4, the call reference EA7 is further transferred via an output AO of the fall-through selection circuit FT to the input AI of the selection circuit SC. From the input AI, the call reference EA7 is transmitted as calling number to the output TO of SC towards the output circuit TR of the telephone and so further to a telephone exchange as already mentioned above.

[0018] The above operations provide the user with an option to automatically contact an external directory service when no matching is found for a search key in his internal or personal address book.

[0019] Additionally, because of the clear separation between the internal address book and the external directory service, an adaptation or insertion of a new entry can be left open to the user or can be done automatically by the operator or service provider himself. This may for instance be done through the connection mentioned above between the circuits RS and TR.

[0020] Other enhancements are also possible. For example, if the retrieved call reference EA7 of the external database TDS is represented in a predetermined format, the telecommunication user terminal can take appropriate actions to store/cache it in its internal database PTD without any user intervention. These actions could be performed by the inter-operation of the fall-through selection circuit FT and the selection circuit SC, or by any other circuit not shown here. In the long run, this will increase the chance of finding a correct call reference in the personal address book or internal database PTD and therefore limiting the amount of hits on the external directory service or database TDS. This is particularly useful in case the user has to pay on a per-search basis. In this case, it is likely that the service can't be made that transparent as described above. The user then probably wants to know how many times he actually contacted the external directory service TDS to find out how much he will have to pay for it.

[0021] While the principles of the invention have been

described above in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation on the scope of the invention, as defined in the appended claims.

Claims

1. Telecommunication user terminal including a database (PTD) with a plurality of memory locations (IA1, ..., IA5, ...) each adapted to store a call reference, said user terminal further including selection means (SC) adapted to select one of said memory locations according to a predetermined input (KB) in said user terminal and to allow a connection to be setup according to the selected call reference, characterized

   in that said database (PTD) includes an extra memory location (XE) adapted to store an extra call reference to a second database (TDS), said second database being external to said telecommunication user terminal and including second memory locations (EA1, ..., EA7, ...) each adapted to store a second call reference, and
   in that said telecommunication user terminal further includes fall-through selection means (FT) adapted to couple said selection means (SC) to said second database in order to select one of said second memory locations according to said predetermined input (KB) and to allow a connection to be setup according to the selected second call reference.

2. Telecommunication set according to claim 1, characterized in that said telecommunication user terminal is a mobile telephone and in that the first mentioned database (PTD) is a user personal telephone directory loaded on a smart-card inserted in said mobile telephone.

3. Telecommunication set according to any of the claims 1 or 2, characterized in that the first mentioned database (PTD) includes the internal personal telephone directory of said telecommunication user terminal.

4. Telecommunication set according to claim 1, characterized in that said fall-through selection means (FT) establishes a connection between said telecommunication user terminal and said second database (TDS) according to said extra call reference and is adapted to recover the selected second call reference and to transmit it to said selection means (SC).
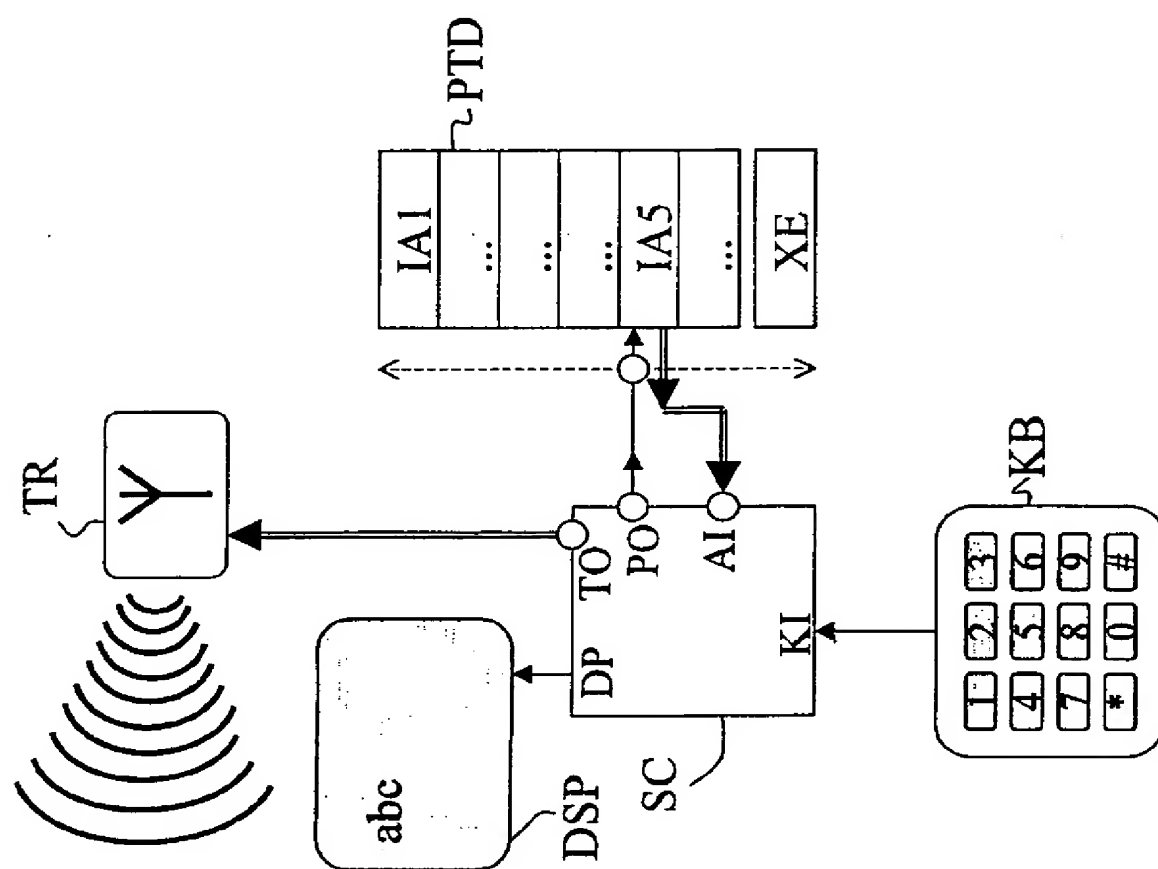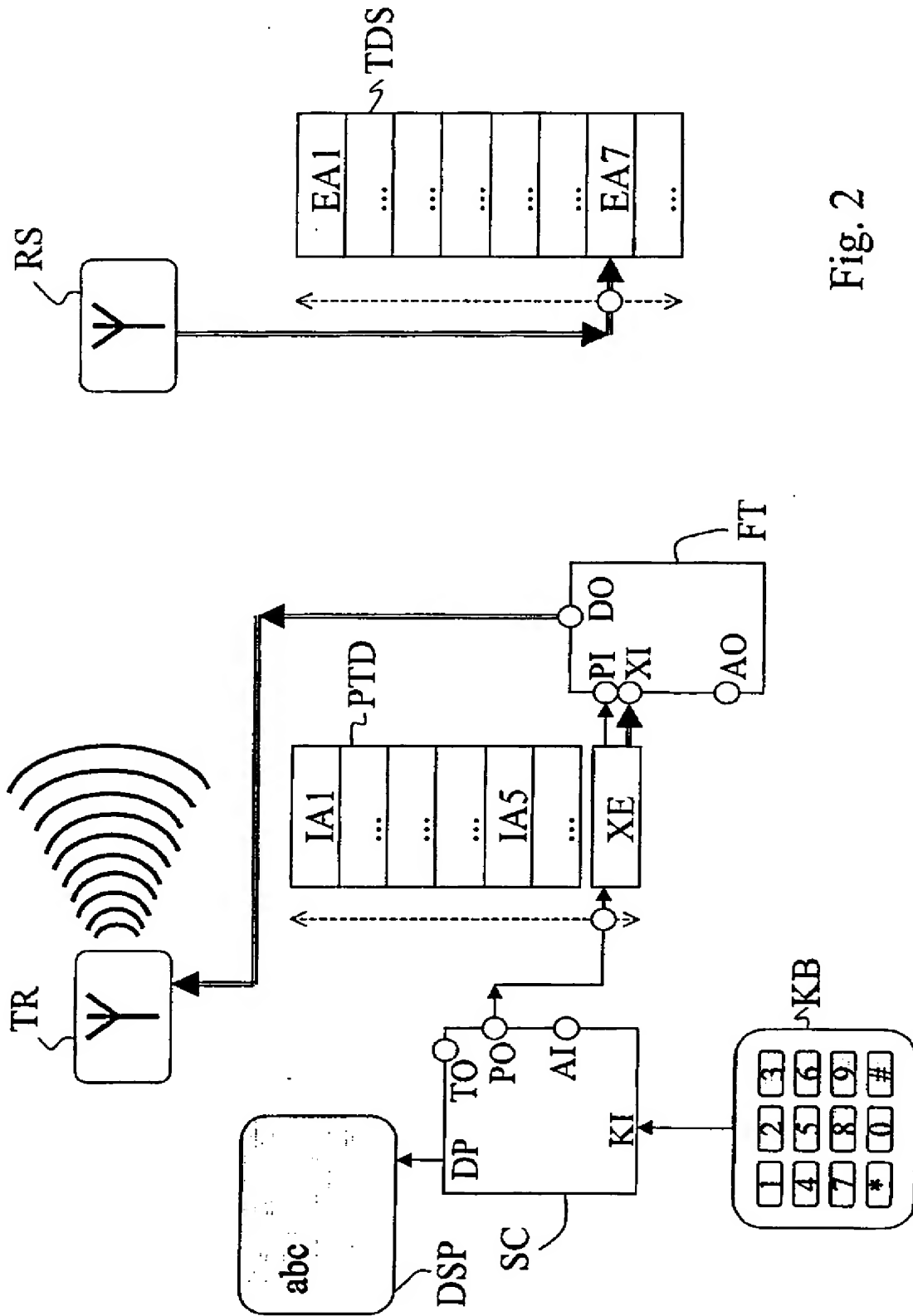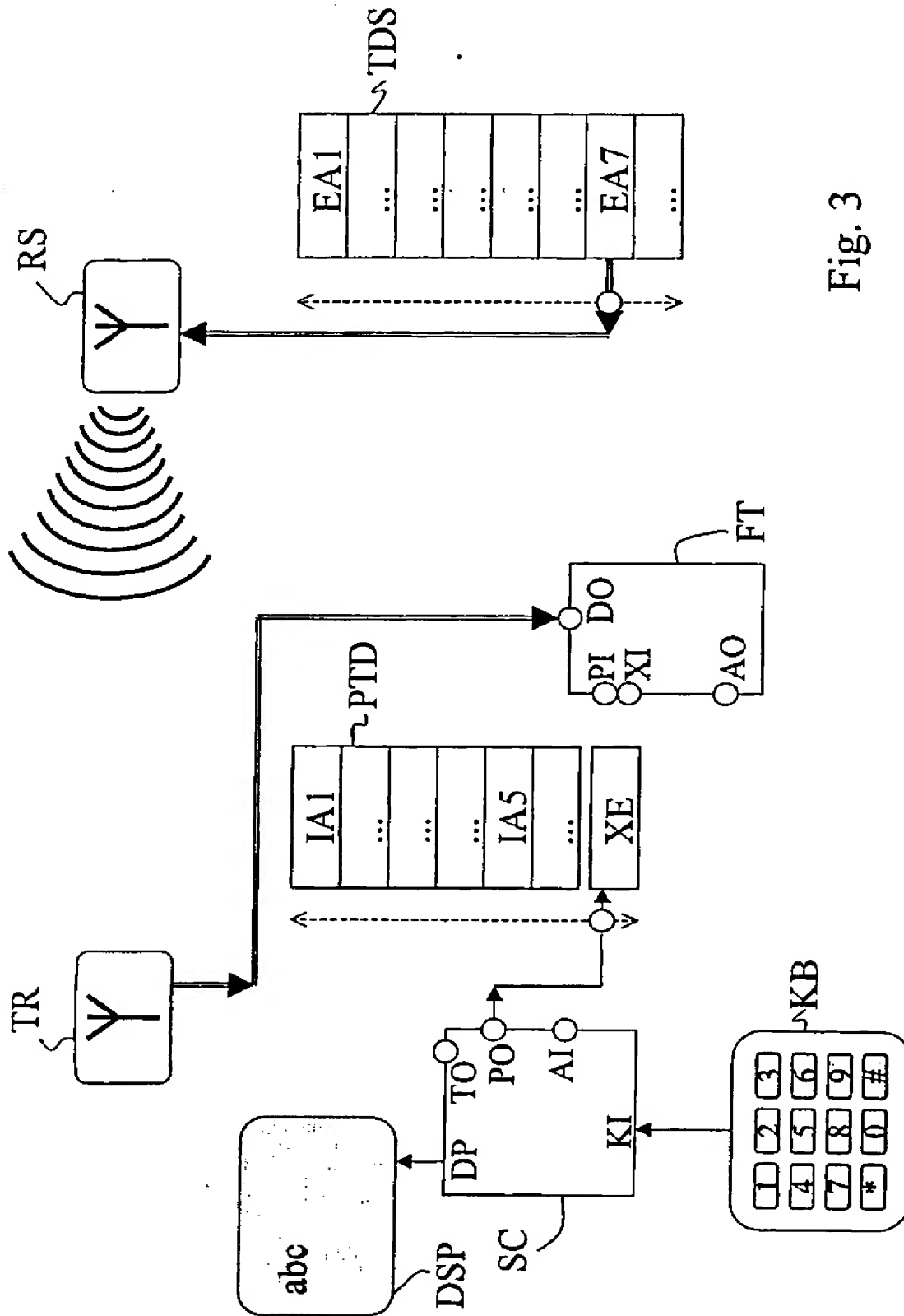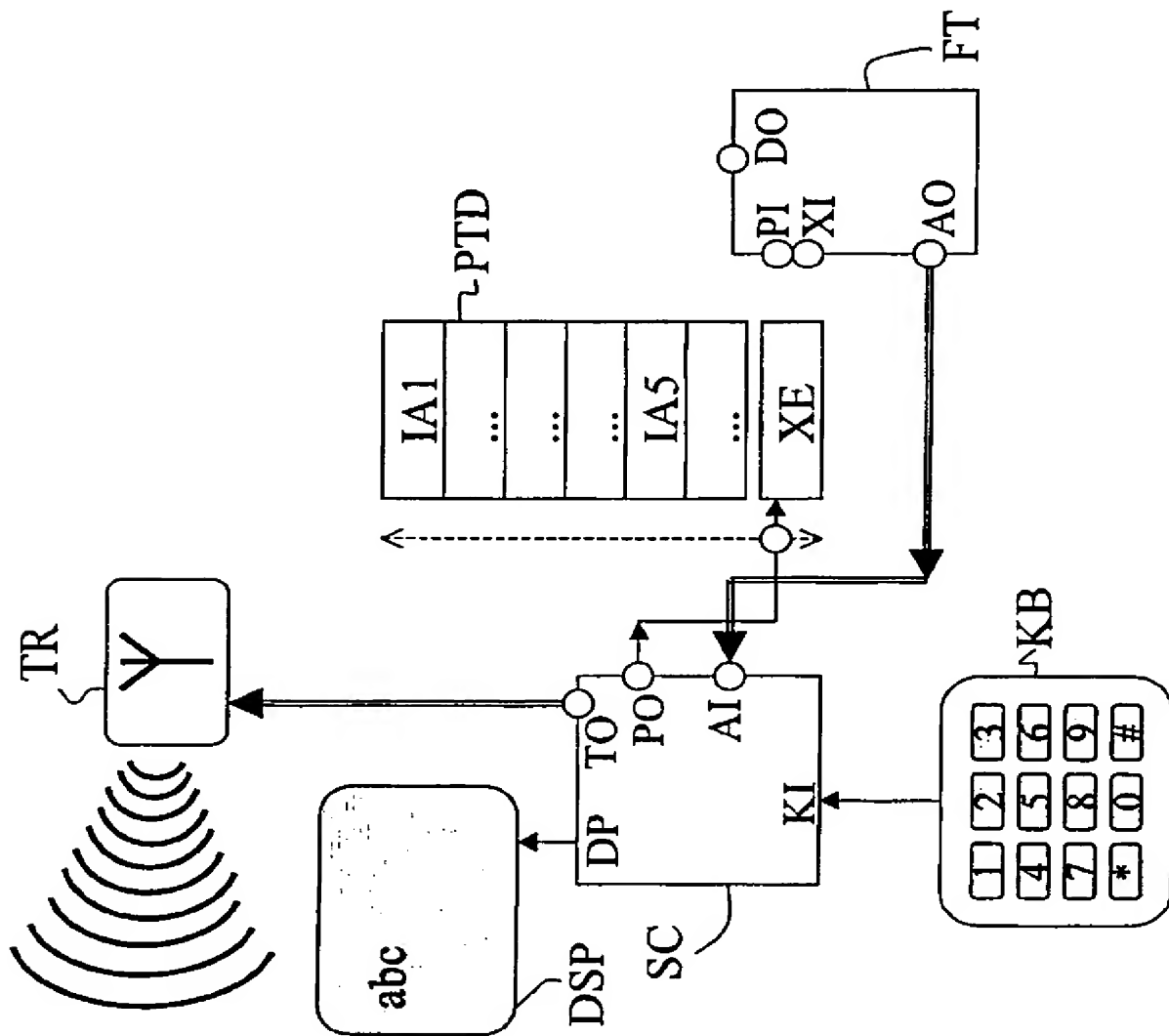
Fig. 1

Fig. 2

Fig. 3

Fig. 4

EUROPEAN SEARCH REPORT

European Patent Office

Application Number

EP 99 40 1326

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	GB 2 264 611 A (SAMSUNG ELECTRONICS CO LTD) 1 September 1993 (1993-09-01) * page 2, line 6 - line 12 * * page 14, line 13 - page 15, line 3 * * page 16, line 5 - page 17, line 6 * * page 3, line 18 - page 4, line 2 *	1-4	H04M3/493 H04M1/274
A	US 5 483 586 A (SUSSMAN LESTER) 9 January 1996 (1996-01-09) * column 2, line 10 - line 30 * * column 4, line 38 - line 59 *	1-4	
A	US 5 204 894 A (DARDEN PAMELA) 20 April 1993 (1993-04-20) * column 3, line 7 - line 34 *	1-4	
A	US 4 734 931 A (TIERNEY JR THOMAS J ET AL) 29 March 1988 (1988-03-29) * column 2, line 6 - line 55 *	1-4	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

H04M

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 October 1999	Schweitz, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 99 40 1326

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-10-1999

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
GB 2264611	A	01-09-1993	KR 9409777 B FR 2689351 A JP 6085894 A		17-10-1994 01-10-1993 25-03-1994
US 5483586	A	09-01-1996	NONE		
US 5204894	A	20-04-1993	NONE		
US 4734931	A	29-03-1988	CA 1265273 A DE 3786101 A DE 3786101 T EP 0238257 A JP 2776500 B JP 62278855 A		30-01-1990 15-07-1993 16-12-1993 23-09-1987 16-07-1998 03-12-1987

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

(54) **Verfahren und Gerät zur automatischen Vervollständigung von Rufnummern mit Datenbankabfrage**

(57) Erfindungsgemäß wird ein Verfahren zur Eingabe einer Rufnummer in ein Telekommunikationsgerät (1) beziehungsweise ein Telekommunikationsgerät (1) vorgeschlagen, bei dem eine Steuerung (3) bereits während der Zifferneingabe für eine Rufnummer oder Zeicheneingabe für einen Namen aus einem Speicher (4) eine passende vollständige Rufnummer bzw. Namen sucht und auf einer Anzeige (5) ausgibt. Stimmt der Vorschlag nicht mit der gewünschten Rufnummer bzw. dem Namen überein, dann sucht das Telekommunikationsgerät (1) mit fortschreitender Zeicheneingabe eine neue Rufnummer bzw. Namen aus dem Speicher (4). Dadurch wird die Treffsicherheit in vorteilhafter Weise verbessert und insgesamt die Eingabe der gewünschten Rufnummer bzw. des Namens vereinfacht, da in der Regel nur ein Teil der gewünschten Rufnummer des Namens einzugeben ist.

Fig. 1

EP 1 259 051 A1
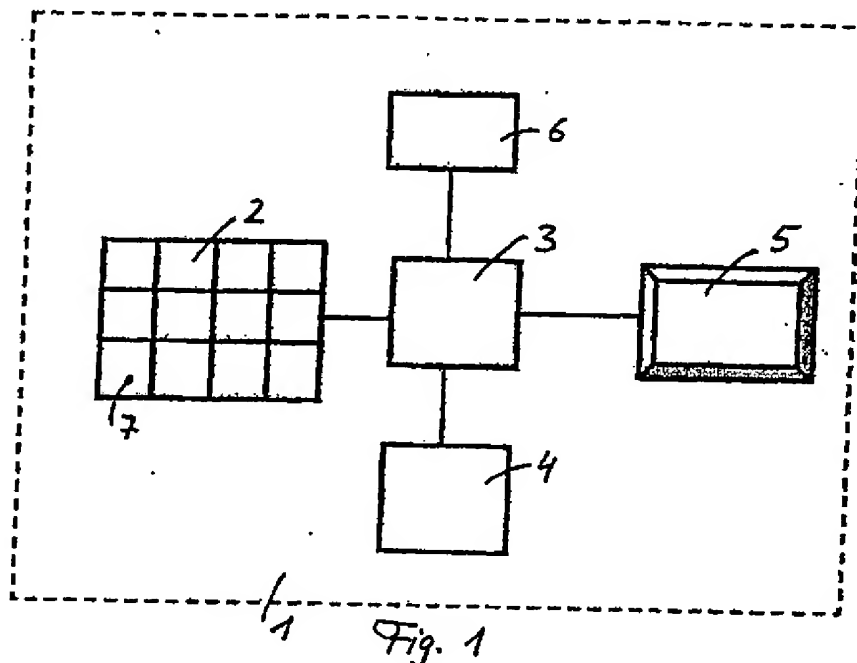
Beschreibung

[0001]   Die Erfindung geht aus von einem Verfahren zur Eingabe einer Rufnummer in ein Telekommunikationsgerät beziehungsweise von einem Telekommunikationsgerät selbst, das mit einem Speicher ausgebildet ist, in dem den gespeicherten Rufnummern korrespondierende alphanumerische Namen zugeordnet sind, nach der Gattung der nebengeordneten Ansprüche 1 und 17. Mit zunehmender Komplexität der Technik sind bereits viele Lösungen bekannt geworden, die die Eingabe von Rufnummern vereinfachen sollen. Bekannt sind beispielsweise schon Komfort-Tastentelefone oder Handys, bei denen nicht nur eine Reihe von Rufnummern gespeichert werden kann. Es ist auch vorgesehen, dass zu jeder Rufnummer ein korrespondierender Name, beispielsweise ein Familienname, ein Firmenname, Adresse, Abteilungsbezeichnung oder dergleichen mit abgespeichert werden. Eine Steuerung sucht nach Eingabe der vollständigen Rufnummer aus dem Speicher den korrespondierenden Namen und zeigt diesen meistens zusammen mit der eingegebenen Rufnummer auf einer in das Telekommunikationsgerät eingebauten Anzeige an.

[0002]   Bekannt ist beispielsweise auch, dass bei einer Telekommunikations-Anlage oder- system, bei dem mehrere Telekommunikationsgeräte zu einem Telekommunikationsnetz zusammengeschaltet sind, ein gemeinsam zu nutzender zentraler Speicher verwendet wird, auf den dann jedes Telekommunikationsgerät einen Zugriff hat. Dieser zentrale Speicher erfüllt dann praktisch die Funktionen, wie sie aus einem konventionellen Telefonbuch bekannt sind. In entsprechend ausgebildeten Telekommunikationsanlagen kann jedoch nicht nur zu einer eingegebenen Rufnummer der korrespondierende Name gesucht werden. Vielmehr ist es auch möglich, zu einem eingegebenen Namen auch die zugehörige Rufnummer zu suchen.

[0003]   Weiterhin ist bekannt, dass bei bestimmten Telefonfunktionen automatisch der Name des Anzurufenden angezeigt wird. So wird beispielsweise bei einer Rufumleitung, bei der die interne Rufnummer eines gewünschten Teilnehmers eingegeben wird, automatisch der korrespondierende Name ersetzt und angezeigt.

[0004]   Bekannt ist auch, dass in solchen Fällen, bei denen die Rufnummer des Anrufenden übertragen wird, in dem zentralen Speicher nach dem korrespondierenden Namen gesucht wird. Dieser wird - wenn er zuvor gespeichert wurde - in der Regel zusammen mit der Rufnummer angezeigt.

[0005]   Eine weitere bekannte Lösung besteht auch darin, Rufnummern so abzuspeichern, dass sie beispielsweise mit Direktwahltasten oder als Kurzwahlnummern aufgerufen werden können. Dieses funktioniert aber nur, wenn die gespeicherten Rufnummern zuvor diesen Tasten zugeordnet wurden. Bei seltener benutzten Rufnummern versagt diese Methode. Auch ist die Anzahl der verfügbaren Kurzwahltasten beschränkt,

so dass auch aus diesem Grund nicht beliebig viele Kurzwahlnummern belegt werden können.

[0006]   Bei allen zuvor genannten Verfahren ist ungünstig, dass die Steuerung des Telekommunikationsgerätes oder des -systems nur dann aktiv wird, wenn die vollständige Rufnummer bereits eingegeben wurde. Diese Arbeit bleibt dem Anrufenden in jedem Fall überlassen. Bei den heutigen vielfach sehr langen Rufnummern mit Prefix, Länder- und Ortsvorwahl oder Apparatenummern (Extension) ergeben sich sehr leicht Eingabefehler, die dann naturgemäß zu unerwünschten und kostenpflichtigen Fehlverbindungen führen können.

[0007]   Das erfindungsgemäße Verfahren zur Eingabe einer Rufnummer in ein Telekommunikationsgerät beziehungsweise das Telekommunikationsgerät mit den kennzeichnenden Merkmalen der nebengeordneten Ansprüche 1 und 17 hat demgegenüber den Vorteil, dass bereits während der Eingabe der Rufnummer und/ oder eines Namens das Telekommunikationsgerät mit der Suche nach einer möglichen Rufnummer beginnt und einen entsprechenden Vorschlag für eine vollständige Rufnummer beziehungsweise einen Namen auf einer Anzeige ausgibt. Dadurch wird die Eingabe der Rufnummer und/oder des Namens durch die Steuerung des Telekommunikationsgerätes unterstützt, so dass im einfachsten Fall nur sehr wenige Ziffern von der Rufnummer einzugeben sind. Der Wahlvorgang wird somit vereinfacht. Als besonders vorteilhaft wird dabei angesehen, dass auch durch die Ausgabe des korrespondierenden Namens eines Anzurufenden die Fehlerrate bei der Zifferneingabe verringert wird. Dadurch wird in vorteilhafter Weise nicht nur die Arbeit für die Eingabe der Rufnummer reduziert und erleichtert, sondern auch die Eingabe zuverlässiger durchgeführt.

[0008]   Durch die in den abhängigen Ansprüchen aufgeführten Maßnahmen sind vorteilhafte Weiterbildungen und Verbesserungen des in den nebengeordneten Ansprüchen 1 und 17 angegebenen Verfahrens zur Eingabe einer Rufnummer beziehungsweise des Telekommunikationsgerätes möglich. Als besonders vorteilhaft wird dabei ansehen, dass insbesondere in solchen Fällen, bei denen mehrere Rufnummern mit einer gleichen Zifferfolge beginnen, auch mehrere alternative Rufnummern gesucht und gleichzeitig auf der Anzeige ausgegeben werden. Dadurch erhält der Anrufende schon nach der Eingabe von nur wenigen Zeichen alternative mögliche Rufnummern und/oder Namen angezeigt, aus denen er seine gewünschte Rufnummer bzw. Namen dann einfach auswählen kann.

[0009]   Eine sehr günstige Lösung wird auch darin gesehen, dass das Telekommunikationsgerät mit fortschreitender Zifferneingabe seine Vorschläge für Rufnummern überprüft. Auf diese Weise wird mit jedem zusätzlich eingegebenen Zeichen die Treffsicherheit für die gewünschte Rufnummer bzw. des Namens erhöht.

[0010]   Eine besonders schnelle Auswahl der gespeicherten Rufnummern und Namen ist vorteilhaft durch eine Tabelle gegeben, die in Form eines Telefonbuches

aufgebaut sein kann. Derartige Tabellen sind beispielsweise alphabetisch gegliedert und leicht auf einer Compact Disc (CD) speicherbar.

[0011] Um die Auswahl einer Rufnummer bzw. Namen aus der Gruppe der vorgeschlagenen Rufnummern zu vereinfachen, kann eine spezielle Funktionstaste am Telekommunikationsgerät vorgesehen sein, mit der die gewünschte Rufnummer bzw. Name markiert und ausgewählt wird.

[0012] Eine günstige alternative Lösung zur Auswahl einer Rufnummer wird auch in einer Cursorsteuerung gesehen, die durch die Funktionstaste betätigt wird.

[0013] Vorteilhaft ist weiterhin, dass sukzessive weitere Ziffern eingegeben werden, wenn die vorgeschlagenen Rufnummern und/oder Namen nicht der gewünschten Rufnummer bzw. Namen entsprechen. Dadurch erhält das Telekommunikationsgerät die Möglichkeit, nach neuen Rufnummern oder Namen zu suchen, die dann der gewünschten Rufnummer näher kommen.

[0014] Um einen eventuell ungültigen Wahlvorgang zu vermeiden, weil die eingegebene Rufnummer von dem Telekommunikationsgerät nicht vollständig erkannt wurde, erfolgt die Eingabe der Rufnummer bzw. des Namens vorteilhaft bei aufliegendem Handapparat.

[0015] Da die gewünschte Rufnummer bzw. Namen zeichenweise eingegeben wird, kann die vorgeschlagene Rufnummer entsprechend überschrieben werden. Die vorgeschlagene Rufnummer bzw. Name wird dadurch ungültig und das Telekommunikationsgerät kann nach einer neuen Rufnummer oder Namen suchen.

[0016] Eine besonders günstige Lösung zur Vereinfachung der Eingabeprozedur ergibt sich auch dadurch, dass eine vorgeschlagene Rufnummer oder Name durch Aufnahme des Handapparates markiert und bestätigt wird. Dieses ist dann für die Steuerung auch das Signal, den Verbindungsaufbau zu starten.

[0017] Vorteilhaft erscheint auch, dass die Suche nach der gewünschten vollständigen Rufnummer in wenigstens einem weiteren Speicher durchgeführt wird, der nicht direkt dem aktuellen Speicher des Telekommunikationsgerätes zugeordnet ist. Dadurch wird in einfacher Weise die Suche automatisch auf weitere verfügbare Speicher ausgedehnt, ähnlich wie eine manuelle Suche in einem örtlichen, nationalen oder globalen Telefonbuch.

[0018] Die Suche nach einer Rufnummer oder einem Namen kann dabei praktisch global in allen zugänglichen Speichern einer Telekommunikationsanlage, eines Anlagenverbundes, in einem öffentlichen oder privaten Netz, national oder international durchgeführt werden, so dass eine sehr umfangreiche Recherche möglich ist. Eine umständliche und kostenintensive Telefonauskunft, wie sie heute noch notwendig ist, kann dann vorteilhaft entfallen.

[0019] Natürlich kann bei entsprechend erweiterten Protokollen vorteilhaft auch in unterschiedlichen Netzen wie analogen oder digitalen Netzen wie in ISDN- oder LAN- Netzen gesucht werden.

[0020] Als besonders vorteilhaft wird angesehen, dass eine ausgewählte Rufnummer und/oder Name durch einfachen Tastendruck in den eigenen Speicher oder einen zugeordneten Speicher übernommen werden kann, so dass sie dann permanent und direkt zur Verfügung steht. Ein umständliches Übertragen beispielsweise durch eine Neueingabe entfällt dadurch in vorteilhafter Weise.

[0021] In alternativer Ausgestaltung der Erfindung ist vorgesehen, die ausgewählte Rufnummer beziehungsweise Namen automatisch in dem zugeordneten Speicher zu speichern. Dieses Vorgehen stellt eine weitere Vereinfachung für das Speichern einer gefundenen Rufnummer oder eines Namens dar.

[0022] Vorteilhaft ist weiterhin, dass bei einem ankommenden Ruf, bei dem beispielsweise auf der Anzeige des Telekommunikationsgerätes nur die Rufnummer angezeigt wird, automatisch auch nach dem Namen oder weiteren Informationen gesucht wird. Für den Angerufenen ist somit schon im Vorfeld erkennbar, wer ihn gerade anrufen möchte, ohne dass er das Gespräch entgegennehmen muss, um zu erkunden, wer der Anrufer sei.

[0023] Vorteilhaft für das Telekommunikationsgerät ist auch die Verbindung mit einer Telekommunikations-Anlage, da die Telekommunikations-Anlage einen gemeinsamen Speicher für alle angeschlossenen Telekommunikationsgeräte aufweist. Dadurch haben alle Telekommunikationsgeräte Zugriff auf die gleiche Datenbasis, separate Speicher werden dadurch weitgehend überflüssig. Das hat den weiteren Vorteil, dass bei einer Aktualisierung der Daten alle angeschlossenen Telekommunikationsgeräte stets Zugriff auf den neuesten Datenbestand haben.

[0024] Ein weiterer Vorteil des Telekommunikationsgerätes wird auch darin gesehen, dass beispielsweise durch einfachen Druck auf eine entsprechend ausgebildete Funktionstaste eine Rufnummer und/oder Name gegebenenfalls mit weiteren Informationen aus einem fremden Speicher in den eigenen Speicher kopiert und übernommen werden kann.

[0025] Eine günstige alternative Lösung besteht auch in einer automatischen Übernahme der gefundenen Rufnummer und/oder des Namens in den eigenen Speicher.

[0026] Der Erfindung liegt die Aufgabe zu Grunde, die Eingabe einer Rufnummer in ein Telekommunikationsgerät zu vereinfachen.

[0027] Diese Aufgabe wird mit den Merkmalen der nebengeordneten Ansprüche 1 und 17 gelöst.

[0028] Ein Ausführungsbeispiel der Erfindung ist in der Zeichnung dargestellt und wird in der nachfolgenden Beschreibung näher erläutert.

Figur 1 zeigt ein Blockschaltbild eines Telekommunikationsgerätes,

Figur 2 zeigt eine Flussdiagramm,

Figur 3 zeigt eine Tabelle,

Figur 4 zeigt in schematischer Darstellung ein Telekommunikationsnetz und

Figur 5 zeigt mehrere Telekommunikations-Endgeräte mit zugeordneten Speichern.

[0029] Das Blockschaltbild der Figur 1 zeigt in schematischer Darstellung ein Telekommunikationsgerät 1, das beispielsweise als stationäres Tastentelefon oder als Funktelefon wie Handy oder dergleichen ausgebildet ist. In alternativer Ausgestaltung der Erfindung kann es auch mit einem Computer gekoppelt sein, der die entsprechenden Such-, Steuer- und Anzeigefunktionen übernimmt. Das Telekommunikationsgerät 1 ist vorzugsweise drahtgebunden oder über ein Funknetz mit weiteren (nicht dargestellten) Telekommunikationsgeräten 1 verbunden. Derartige Telekommunikationssysteme oder -anlagen sind per se bekannt, so dass sie nicht in allen Einzelheiten beschrieben werden müssen.

[0030] In Figur 1 wurden nur die Wesentlichen Baugruppen dargestellt, auf die sich die Erfindung im Einzelnen bezieht. Zur Eingabe von Rufnummern und/oder auch Namen in alphanumerischen Zeichen ist eine Tastatur 2 vorgesehen, die je nach Ausstattung des Telekommunikationsgerätes 1 mehr oder weniger viele Tasten aufweist. Zusätzlich können eine oder mehrere entsprechend ausgebildete Funktionstasten 7 vorgesehen sein, mit denen die Bedienung des Telekommunikationsgerätes 1 erleichtert wird. Beispielsweise kann mit den Funktionstasten 7 die Speicherung von Rufnummern und Namen, eine Rufweiterleitung, Kurzwahltasten, Lauthören usw. gesteuert werden.

[0031] Die Tastatur 2 ist mit einer Steuerung 3 verbunden, die beispielsweise bei einem Komforttelefon mit einem Computerchip, Arbeitsspeicher, einem Steuerprogramm und dergleichen ausgebildet ist. Die Steuerung 3 ist mit einem Speicher 4 verbunden, in dem die Rufnummern und/oder die korrespondierenden Namen speicherbar sind.

[0032] Alternativ ist vorgesehen, in einem Telekommunikationssystem einen gemeinsamen Speicher 4 anzulegen, in dem die gespeicherten Daten tabellarisch in Form eines Telefonbuches abgelegt sind. Derartige Speicher sind als Massenspeicher, beispielsweise als Plattenspeicher, Compact Disc (CD) usw. per se bekannt. Mit Hilfe von geeigneten Softwareprogrammen können die gespeicherten Daten in geeigneter Weise nach Rufnummern Namen und/oder weiteren Informationen durchsucht werden.

[0033] Um eingegebene und ausgegebene Rufnummern und Daten sichtbar zu machen und besser kontrollieren zu können, ist die Steuerung 3 mit einer Anzeige 5 verbunden, die je nach Ausführungsform als ein- oder mehrzeiliges LCD-Display oder als üblicher Monitor ausgebildet sein kann. An Stelle der LCD-Anzeige kann die Anzeige 5 auch als Lumineszenz- Anzeige oder sonstige optische Anzeige ausgebildet sein. Für die Sprachein- und -ausgabe ist des weiteren die Steuerung 3 mit einem Handapparat 6 verbunden, der üblicherweise ein Mikrofon und einen Lautsprecher (Ohrhörer) enthält. Natürlich ist in alternativer Ausgestaltung der Erfindung der Handapparat 6 auch in das Telekommunikationsgerät 1 integriert eingebaut und beispielsweise über eine der erwähnten Funktionstasten 7 aktivierbar.

[0034] Die Funktionsweise des Verfahrens zur automatischen Vervollständigung einer unvollständig eingegebenen Rufnummer wird an Hand der Figuren 2 und 3 näher erläutert. Grundsätzlich ist dabei vorgesehen, dass zur Vervollständigung der eingegebenen Rufnummer und/oder des Namens die Steuerung selbsttätig in einem oder mehreren verfügbaren Speichern nach geeigneten Rufnummern bzw. Namen sucht. Dabei werden die Rufnummern und Namen als Treffer ausgegeben, die wenigstens der eingegebenen Zeichenfolge entsprechen.

[0035] Figur 2 zeigt zunächst ein Flussdiagramm für den Verfahrensablauf bei der Eingabe einer gewünschten Rufnummer. In Position 10 zeigt eine Markierung 9 (Cursor) auf der Anzeige 5 an, dass nun die erste Ziffer der gewünschten Rufnummer eingegeben werden kann. Die Initialisierung des Cursors 9 erfolgt beispielsweise automatisch bei der Eingabe einer ersten Ziffer oder durch Druck auf eine spezielle Funktionstaste 7.

[0036] Wurde zum Beispiel als erste Ziffer eine "0" eingegeben, dann springt der Cursor 9 um eine Stelle weiter nach rechts und wartet auf die Eingabe der nächsten Ziffer. Gleichzeitig startet die Steuerung 3 den Suchlauf in dem Speicher 4 nach Rufnummern, die mit der Ziffer "0" beginnen. In Position 11 wurde beispielsweise die Rufnummer "061011590" gefunden, die nun auf der Anzeige 5 zu sehen ist. Im allgemeinen sind in dem Speicher 4 sehr viele Rufnummern gespeichert, die mit der Ziffer "0" beginnen. Auf der Anzeige 5 können dann einige, zum Beispiel in aufsteigender Reihenfolge dargestellt werden. Da nicht alle Rufnummern gleichzeitig dargestellt werden können, kann mit einer der Funktionstasten 7 die gefundene Liste mit den vorgeschlagenen Rufnummern entweder seitenweise oder zeilenweise weitergeschaltet oder gescrollt werden. Mit einer weiteren Funktionstaste 7 kann dann eine der vorgeschlagenen Rufnummern markiert und als gewünschte Rufnummer ausgewählt werden.

[0037] Es ist auch vorgesehen, dass zu den Rufnummern gleichzeitig der korrespondierende Name gegebenenfalls mit weiteren Informationen angezeigt wird.

[0038] In alternativer Ausgestaltung der Erfindung werden beispielsweise die vorgeschlagenen Rufnummern in alphabetischer Reihenfolge der Namen sortiert und dann auf den Anzeige 5 dargestellt.

[0039] Aus Übersichtlichkeitsgründen wurde in dem Flussdiagramm der Figur 2 jedoch nur eine vorgeschlagene Rufnummer dargestellt, die für die weiteren Erläuterungen herangezogen wird.

[0040] Unabhängig von dem zuvor beschriebenen Verfahren kann an der Cursorposition, die in unserem Beispiel durch die unterstrichene Ziffer "6" markiert ist, die nächste Ziffer eingegeben und somit die vorgeschlagene Rufnummer überschrieben wird. Dies ist dann notwendig, wenn die gewünschte Rufnummer nicht in der Liste der vorgeschlagenen Rufnummern enthalten ist. Sinnvoll ist dies auch, wenn die Treffsicherheit nicht sehr groß ist und zu viele Rufnummern vorgeschlagen werden. Mit zunehmender sukzessiver Eingabe von Ziffern der gewünschten Rufnummer wird die Trefferquote verbessert und es werden immer weniger Rufnummern vorgeschlagen, die mit der gleichen Ziffernfolge beginnen. Dadurch wird die Auswahl für die gewünschte Rufnummer vorteilhaft vereinfacht.

[0041] Nach Bestätigung der Ziffer "6" ist in Position 12 der Cursor 9 auf die dritte Position gesprungen, so dass er jetzt die Ziffer 1 markiert. Die Bestätigung einer Ziffer kann entweder durch Eingabe der markierten Ziffer oder durch manuelles Weiterschalten des Cursors 9 mit einer der Funktionstasten 7 erfolgen.

[0042] Es wird nun angenommen, dass die vorgeschlagene Rufnummer nicht der gewünschten Rufnummer entspricht. Daher wird in Position 13 die Ziffer "1" mit der Ziffer "9" überschrieben. Der Cursor 9 springt nun auf die vierte Position. Gleichzeitig sucht die Steuerung 3 aus dem Speicher 4 eine neue Rufnummer, die mit der Ziffernfolge 069 beginnt. Es wird angenommen, dass die Steuerung 3 nun die Rufnummer "06997383114" gefunden hat, die auf der Anzeige 5 dargestellt wird. Der Cursor 9 steht dabei unter der zweiten Ziffer "9". Falls die vorgeschlagene Rufnummer noch nicht der gewünschten Rufnummer entspricht, kann nun die Ziffer "9" überschrieben werden.

[0043] Dieses Verfahren wird solange fortgeführt, bis die Steuerung 3 eine Rufnummer vorschlägt, die der gewünschten Rufnummer entspricht. Wurde diese gefunden, dann kann der Wahlvorgang beispielsweise durch Abnehmen des Handapparates 6 oder durch Drücken einer Funktionstaste 7 eingeleitet werden.

[0044] Vorzugsweise wird der Suchvorgang mit aufgelegtem Handapparat 6 durchgeführt und der Wahlvorgang erst dann gestartet, wenn ein entsprechendes Signal eingegeben wurde.

[0045] In alternativer Ausgestaltung der Erfindung ist vorgesehen, dass auch ein alphanumerischer Namen in Form von einzelnen Buchstaben eingegeben werden kann. Als Name kann ein Rufname, ein Firmenname, eine Adresse oder ein geeignetes Suchwort verwendet werden. Das setzt jedoch voraus, dass das Telekommunikationsgerät eine geeignete Eingabetastatur aufweist. Der Suchablauf erfolgt dann in der gleichen Weise, wie er zuvor bei der Zifferneingabe beschrieben wurde.

[0046] Figur 3 zeigt eine Tabelle 14, wie sie im Speicher 4 abgelegt sein kann. Sie enthält beispielsweise alle Rufnummern mit den korrespondierenden Namen, gegebenenfalls weitere Informationen wie Adressen, Firmen- oder Abteilungsbezeichnungen, Titel, Anrede,

Notdienste usw. Diese Tabelle wird auszugsweise in Abhängigkeit von der eingegebenen Ziffernfolge auf der Anzeige 5 dargestellt, wobei vorzugsweise hier die Darstellung aus Übersichtlichkeitsgründen auf die notwendigsten Informationen wie der Rufnummer und dem korrespondierenden Namen beschränkt ist. Durch Betätigung einer Funktionstaste 7 können die weiteren gespeicherten Informationen jedoch zusätzlich eingeblendet werden.

[0047] Vom Prinzip her ist die Anzahl der gespeicherten Rufnummern mit den korrespondierenden Namen nicht beschränkt und richtet sich im wesentlichen nach der Art und der Größe des verwendeten Speichers 4.

[0048] Figur 4 zeigt in schematischer Darstellung ein per se bekanntes Telekommunikationsnetz mit unterschiedlichen Telekommunikationsgeräten 44 bis 48, mit denen beliebige Teilnehmer telefonieren können. Mit einer (örtlichen) Telekommunikations-Anlage 41 sind beispielsweise zwei Funktelefone 44 drahtlos verbunden. Diese Funktelefone 44 weisen ebenso wie die Telekommunikations-Anlage 41 entsprechende Antennen 43 auf, über die beispielsweise nach dem DECT-Standard (Digital Enhanced Cordless Telekommunication) eine Verbindung aufgebaut werden kann. An die Telekommunikations-Anlage 41 sind in unserem Ausführungsbeispiel zwei weitere Telefone 45, 46 über eine übliche Drahtverbindung angeschlossen. Diese Telefone können analog oder digital arbeiten und beliebigen Komfortklassen entsprechen. Ein weiteres Telefon 47 ist über ein digitales Netz wie LAN (Local Area Network) angeschlossen. Über die Tasten dieser Telefone können beispielsweise durch Mehrfachdrücken häufig auch alphanumerische Zeichen eingegeben bzw. ausgewählt werden, wenn dies bisweilen auch mühsam erscheint.

[0049] Des weiteren ist auch ein Telefon-Computer 48 vorgesehen, der mit einem Handapparat 49 verbunden ist. Der Telefon-Computer 48 ist seinerseits über eine LAN-Schnittstelle oder eine ISDN-Schnittstelle (Integrated Services Digital Network) mit der Telekommunikations-Anlage 41 verbunden. Der Telefon-Computer 48 weist in der Regel eine (nicht dargestellte) Tastatur auf, mit der in einfacher Weise nicht nur Rufnummern, sondern auch alphanumerische Zeichen wie Namen, Adressen oder dergleichen eingegeben werden können. Die einzelnen Telekommunikationsgeräte 44-48 sind per se bekannt und müssen daher nicht näher erläutert werden.

[0050] Die Telekommunikations-Anlage 41 weist neben einer Steuerung, Netzwerkschaltern usw. noch einen Server 42 auf, der im wesentlichen als Speicher ausgebildet ist und den angeschlossenen Telekommunikationsgeräten 44 bis 48 zur Verfügung steht. In diesem Speicher sind in Form eines Telefonbuches Rufnummern und/oder Namen mit gegebenenfalls ergänzenden Informationen abgelegt. Der Speicher kann dabei so aufgebaut sein, dass jedem Telekommunikationsgerät 44 bis 48 ein eigener Speicherbereich zugewiesen ist.

[0051] Erfindungsgemäß ist jedoch vorgesehen, das die Suche nach einer Rufnummer und/oder einem Namen nicht nur in dem eigenen Speicher, sondern auch in weiteren Speichern, vorzugsweise in allen freigegebenen Speichern ermöglicht wird. Dazu ist jedoch eine entsprechende Protokollerweiterung erforderlich.

[0052] Die in unserem Beispiel örtliche Telekommunikations-Anlage 41 ist des weiteren über ein Telekommunikationsnetz 50 mit einer oder mehreren Telekommunikationsgeräten oder Telekommunikations-Anlagen 51 verbunden. Diese Telekommunikations-Anlagen 51 sind ähnlich wie zuvor beschrieben aufgebaut und weisen ebenfalls entsprechende Speicher auf, in denen ebenfalls Rufnummern mit zugeordneten Namen und weiteren Informationen gespeichert sind. Bei der Suche in diesen Speichern erhält der Teilnehmer ein globales Telefonbuch, in dem er seine gewünschte Rufnummer und/oder Namen suchen kann.

[0053] Bei der praktischen Suche einer Rufnummer oder eines Namens wird vorteilhaft so vorgegangen, dass der Teilnehmer zunächst in seinem eigenen Speicher oder seinem Speicherbereich seiner örtlichen Telekommunikations-Anlage 41 sucht. Wenn die gewünschte Rufnummer oder Name nicht gefunden wurde, werden alle freigegebenen oder für eine Gruppe freigegebenen Speicherbereiche der Anlage durchsucht. Führt diese Suche noch nicht zu Ziel, werden vorzugsweise mit abnehmender Priorität Speicher anderer Telekommunikations-Anlagen 51 durchsucht. Dies können beispielsweise Telekommunikations-Anlagen in einem Netzverbund, das gesamte nationale und internationale Netz, analoge Netze, digitale Netze wie ISDN, LAN oder dergleichen sein.

[0054] Erscheint die gewünschte Rufnummer oder der Name, kann diese mittels einfachem Druck auf eine entsprechend vorprogrammierte Funktionstaste übernommen und im eigenen Speicher abgelegt werden. Alternativ ist vorgesehen, diesen Vorgang auch zu automatisieren.

[0055] Da das Suchen in den Speichern aller Telekommunikationsgeräte 44 bis 48 insbesondere wegen langer Laufzeiten und Antwortzeiten aufwändig und langsam sein kann, werden vorzugsweise die zentralen Speicher, zum Beispiel Server 42, von Telekommunikations-Anlagen 41, 51 durchsucht.

[0056] Ein entsprechender Ablauf für die Suche nach einer Rufnummer oder einen Namen ist beispielhaft in Figur 5 dargestellt. Die Endgeräte 54 (Telekommunikationsgeräte) 1, 2...n sind mit entsprechenden Speichern Tln 1, Tln 2...Tln n vorzugsweise eines Zentralspeichers 52 verbunden. Dieser Zentralspeicher 52 weist noch einen allgemeinen Rufnummernspeicher (Speicher 0) auf, in dem auch die zugeordneten Namen und gegebenenfalls zusätzliche Informationen mit abgelegt sind. Alternativ können diese Speicher Tln 1, Tln 2...Tln n auch direkt bei den Endgeräten angeordnet sein.

[0057] Sowohl die Teilnehmer bezogenen Speicher Tln 1, Tln 2...Tln n als auch der allgemeine Speicher 0

weisen des weiteren nicht öffentliche Bereiche auf, in denen vertrauliche Daten abgelegt sind. In den vertraulichen Daten kann natürlich nicht gesucht werden.

[0058] Gesteuert werden die einzelnen Speicher Tln 1, Tln 2...Tln n, 0 von einer Steuereinheit 53, die per se bekannt ist. Die Steuereinheit 53 ist über ein Telekommunikationsnetz 55 mit wenigstens einer weiteren Telekommunikations-Anlage 56 verbunden, die ebenfalls entsprechende Speicher aufweist, in denen öffentlich gesucht werden kann.

[0059] In weiterer Ausgestaltung der Erfindung ist vorgesehen, dass in solchen Fällen, bei denen bei einem ankommenden Ruf nur die Rufnummer angezeigt wird, in den verschiedenen Speichern auch nach dem Namen gesucht wird, wenn dieser Name nicht vorher schon gespeichert war. Das gleiche gilt natürlich auch umgekehrt, wenn nur der Name angezeigt wurde. Des weiteren ist vorgesehen, auch den speichernden Teilnehmer im eigenen Speicher festzuhalten. Dadurch kann auf einfache Weise zu diesem Teilnehmer ein Rückruf gestartet werden oder ein Gespräch an diesen weitergeleitet werden.

Patentansprüche

1. Verfahren zur Eingabe einer Rufnummer und/oder eines Namens in ein Telekommunikationsgerät (1), wobei das Telekommunikationsgerät (1) einen Speicher (4) aufweist, in dem gespeicherte Rufnummern enthalten sind, denen gegebenenfalls korrespondierende alphanumerische Namen, Adressen oder dergleichen zugeordnet sind, und wobei das Telekommunikationsgerät (1) zu einer eingegebenen Rufnummer den korrespondierenden Namen aus dem Speicher (4) ausliest und auf einer Anzeige (5) ausgibt, **dadurch gekennzeichnet, dass** das Telekommunikationsgerät (1) bereits während der Eingabe der noch unvollständigen Rufnummer und/oder eines Namens die Suche nach der vollständigen Rufnummer und/oder dem Namen beginnt und dass das Telekommunikationsgerät (1) einen Vorschlag für eine vollständige Rufnummer und/oder den Namen auf der Anzeige (5) ausgibt, die die eingegebene Ziffernfolge und/oder den Namen ergänzt.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** das Telekommunikationsgerät (1) gleichzeitig wenigstens eine weitere Rufnummer und/oder einen weiteren Namen ausgibt.

3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Telekommunikationsgerät (1) mit fortschreitender, dem Vorschlag nicht entsprechenden Zeicheneingabe wenigstens eine neue Rufnummer und/oder Namen ausgibt.

4. Verfahren nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Telekommunikationsgerät (1) den Namensvorschlag aus einer Tabelle (14) eines gespeicherten Telefonbuches auswählt.

5. Verfahren nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** mittels einer Funktionstaste (7) von den auf der Anzeige (5) dargestellten Rufnummern und/oder Namen die gewünschte Rufnummer beziehungsweise der Name ausgewählt wird.

6. Verfahren nach Anspruch 5, **dadurch gekennzeichnet, dass** die Funktionstaste (7) eine Cursorsteuerung betätigt.

7. Verfahren nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sukzessive weitere Ziffern oder Zeichen eingegeben werden, wenn die vorgeschlagene Rufnummer und/oder Name nicht der gewünschten Rufnummer entspricht.

8. Verfahren nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Zeichen bei aufliegendem Handapparat (6) eingegeben werden.

9. Verfahren nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** ein falscher Vorschlag für eine Rufnummer oder Namen überschrieben wird.

10. Verfahren nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** eine vorgeschlagene Rufnummer oder Name durch Aufnahme des Handapparates (6; 49) markiert und/oder gespeichert wird.

11. Verfahren nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Suche nach der gewünschten vollständigen Rufnummer und/oder dem Namen in wenigstens einem weiteren Speicher (52) durchgeführt wird, der nicht direkt dem aktuellen Speicher des Telekommunikationsgerätes (1;44 bis 48) zugeordnet ist.

12. Verfahren nach Anspruch 11, **dadurch gekennzeichnet, dass** die Suche in allen zugänglichen Speichern (52) einer Telekommunikations-Anlage (41), eines Anlagenverbundes, in einem öffentlichen oder privaten Netz (50), national und/oder international durchgeführt wird.

13. Verfahren nach einem der Ansprüche 11 oder 12, **dadurch gekennzeichnet, dass** die Suche in unterschiedlichen Netzen (50) wie analogen oder digitalen Netzen, vorzugsweise ISDNoder LAN-Netzen durchgeführt wird.

14. Verfahren nach einem der Ansprüche 11 bis 13, **dadurch gekennzeichnet, dass** eine ausgewählte vollständige Rufnummer und/oder Name gegebenenfalls mit weiteren Informationen durch Druck auf eine Funktionstaste (7) in den eigenen Speicher (4) beziehungsweise einen zugeordneten Zentralspeicher (52) abgelegt wird und künftig aus diesem abgerufen werden kann.

15. Verfahren nach einem der Ansprüche 11 bis 13, **dadurch gekennzeichnet, dass** die ausgewählte vollständige Rufnummer und/oder Name gegebenenfalls mit weiteren Informationen automatisch in dem zugeordneten Speicher (52) gespeichert wird.

16. Verfahren nach einem der Ansprüche 11 bis 15, **dadurch gekennzeichnet, dass** bei einem ankommenden Ruf, bei dem nur die Rufnummer des Anrufers auf der Anzeige (5) angezeigt wird, zusätzlich nach dem Namen des Anrufers gesucht und dessen Namen gegebenenfalls mit weiteren Informationen angezeigt und/oder gespeichert wird.

17. Telekommunikationsgerät zur Durchführung des Verfahren nach einem der vorhergehenden Ansprüche, mit einem Speicher (4), in dem beispielsweise den Rufnummern korrespondierende Namen, Adressen oder dergleichen abgelegt sind, mit einer Steuerung (3) zur Auswahl des korrespondierenden Namens und mit einer Anzeige (5), **dadurch gekennzeichnet, dass** die Steuerung (3) ausgebildet ist, bereits während der Eingabe einer Ziffernfolge und/oder eines Namens eine vollständige Rufnummer in wenigstens einem weiteren Speicher (4;52) einer Telekommunikationsanlage (41,51) und/oder eines -netzes (50) zu suchen und entsprechende Rufnummern und/oder Namen, die mit der eingegebenen Zeichenfolge beginnen, auszuwählen und auf der Anzeige (5) darzustellen.

18. Telekommunikationsgerät nach Anspruch 17, **dadurch gekennzeichnet, dass** auf der Anzeige (5) weitere Rufnummern und/oder Namen in Form einer Tabelle (14) darstellbar sind.

19. Telekommunikationsgerät nach einem der Ansprüche 17 oder 18, **dadurch gekennzeichnet, dass** das Telekommunikationsgerät (1; 44 bis 48) mit einer Telekommunikations-Anlage (41) in Verbindung steht.

20. Telekommunikationsgerät nach einem der Ansprüche 17 bis 19, **dadurch gekennzeichnet, dass** das Telekommunikationsgerät (1; 44 bis 48) eine Funktionstaste (7) aufweist, mit der eine noch nicht ge-

speicherte Rufnummer und/oder Name, die aus einem anderen Speicher übernommen wurde, gegebenenfalls mit weiteren Informationen speicherbar ist.

21. Telekommunikationsgerät nach einem der Ansprüche 17 bis 19, **dadurch gekennzeichnet, dass** das Telekommunikationsgerät (1;44 bis 48) ausgebildet ist, eine noch nicht gespeicherte Rufnummer und/oder Namen, die aus einem anderen Speicher übernommen wurde, gegebenenfalls mit weiteren Informationen automatisch zu speichern.

5

10

15

20

25

30
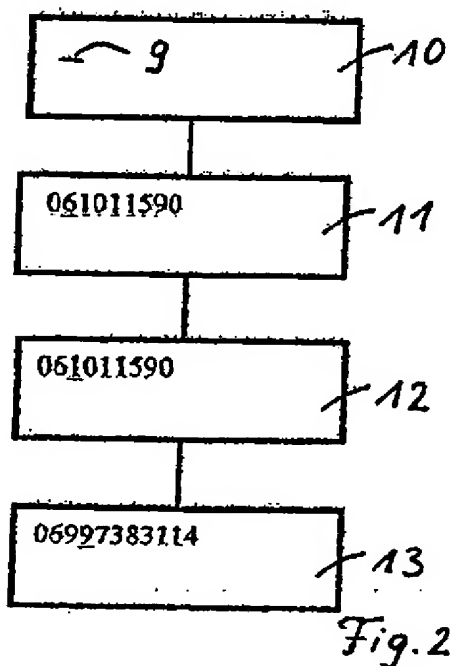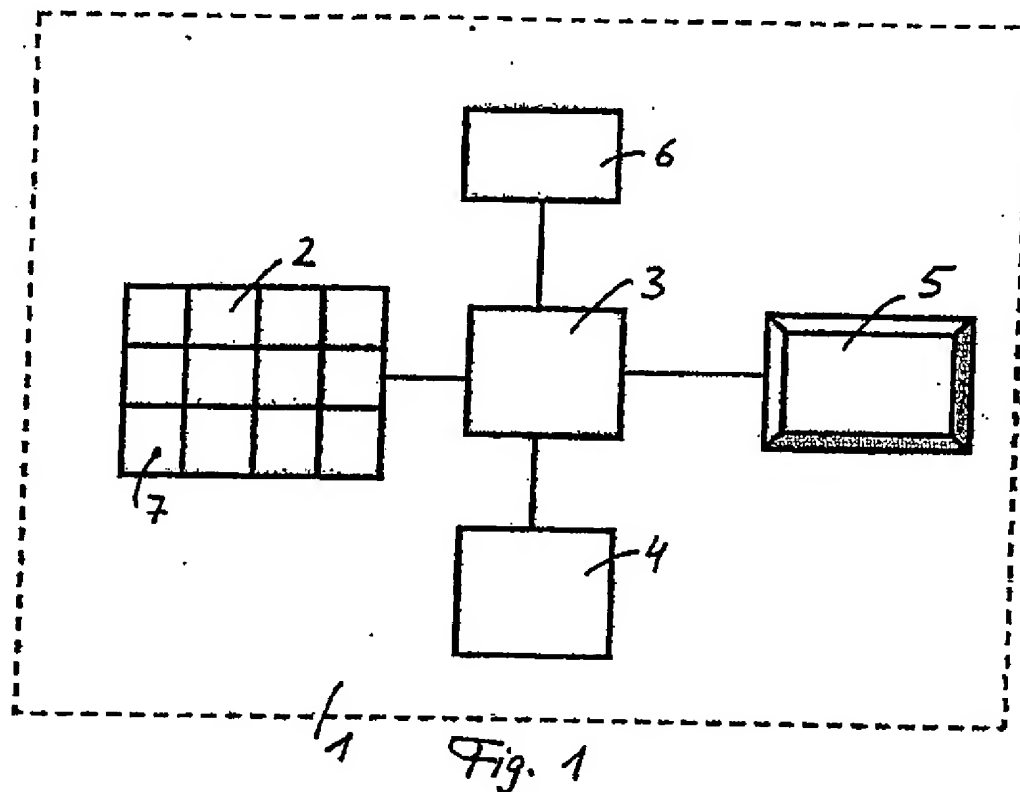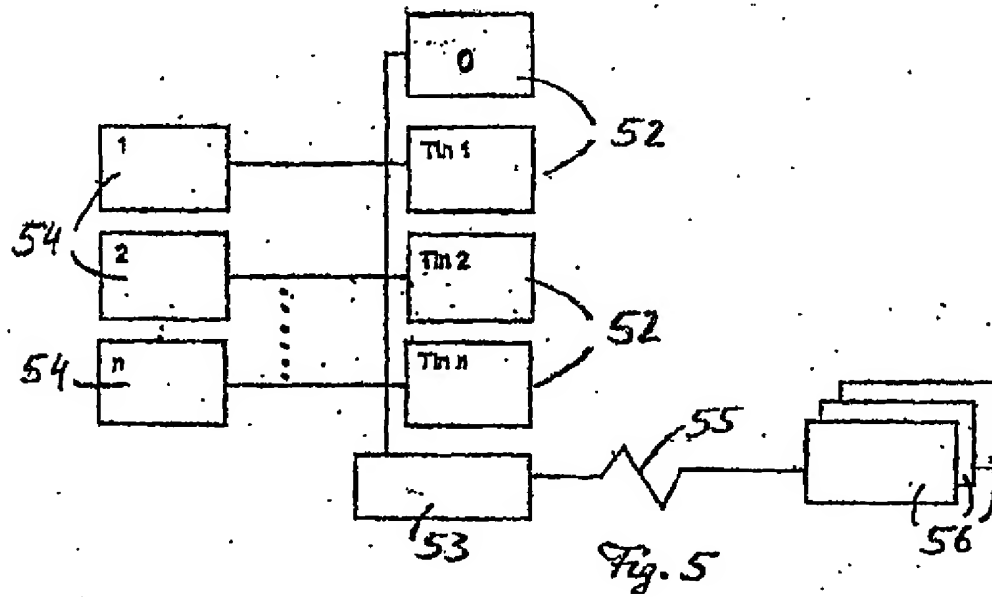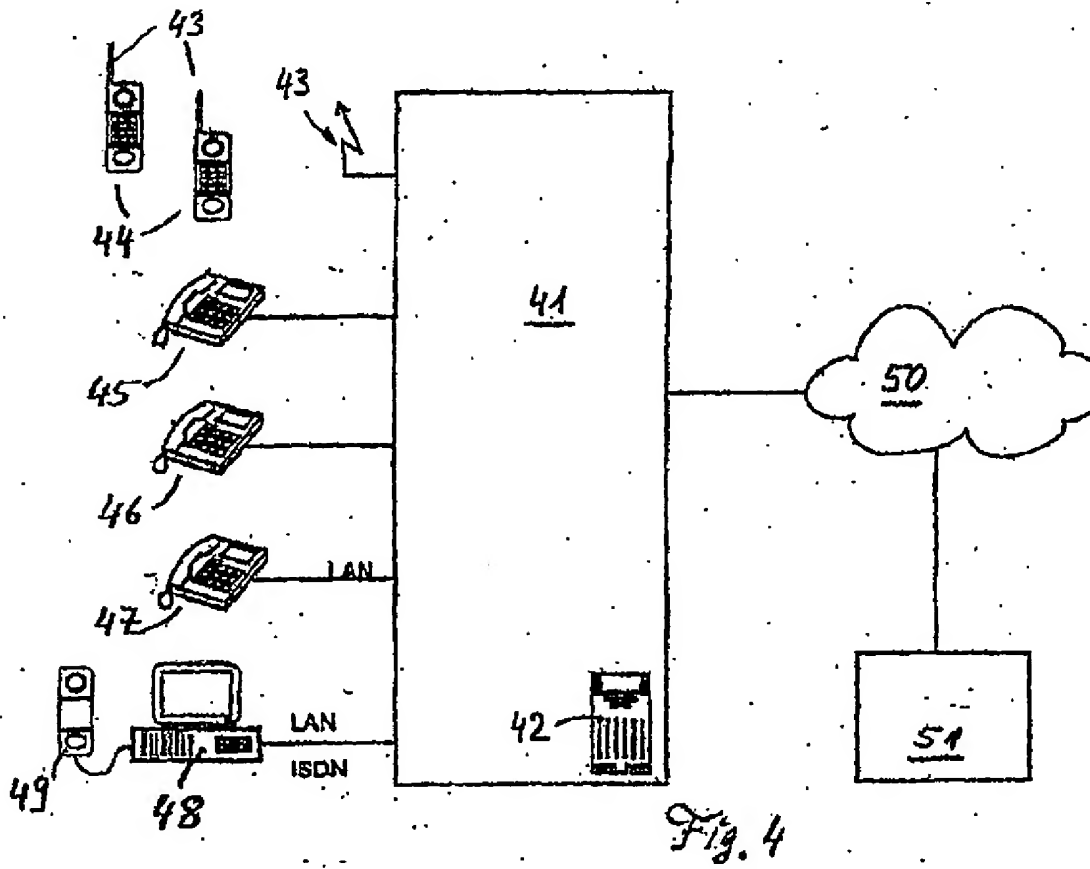
35

40

45

50

55

Fig. 1

Fig. 2

Schmidt	061011590
Meier	081154711
Bauer	06975057315
Hofmann	06997383114
Hartmann	06977857316
Störungsstelle	069662330
...	
...	
...	

Fig. 3

Fig. 4

Fig. 5

Europäisches
Patentamt

EUROPÄISCHER RECHERCHENBERICHT

Nummer der Anmeldung

EP 02 01 0603

EINSCHLÄGIGE DOKUMENTE

Kategorie	Kennzeichnung des Dokuments mit Angabe, soweit erforderlich, der maßgeblichen Teile	Betrifft Anspruch	KLASSIFIKATION DER ANMELDUNG (Int.Cl.7)
X	EP 1 006 704 A (ECI TELECOM LTD) 7. Juni 2000 (2000-06-07) * Zusammenfassung * * Spalte 1, Zeile 9-55 * * Spalte 2, Zeile 14 - Spalte 3, Zeile 4 *	1-21	H04M1/2745 G06F17/27
X	EP 1 054 329 A (SUN MICROSYSTEMS INC) 22. November 2000 (2000-11-22) * Zusammenfassung * * Spalte 2, Zeile 47 - Spalte 3, Zeile 10 * * Spalte 9, Zeile 5-39 * * Spalte 11, Zeile 15-20 *	1-21	
A	WO 01 31509 A (QUALCOMM INC) 3. Mai 2001 (2001-05-03) * das ganze Dokument *	1-21	
A	EP 1 061 714 A (NOKIA MOBILE PHONES LTD) 20. Dezember 2000 (2000-12-20) * das ganze Dokument *	1-21	
A	EP 0 957 674 A (SORVIK BENGT) 24. November 1999 (1999-11-24) * das ganze Dokument *	1-21	RECHERCHIERTE SACHGEBIETE (Int.Cl.7) H04M G06F

Der vorliegende Recherchenbericht wurde für alle Patentansprüche erstellt

Recherchenort	Abschlußdatum der Recherche	Prüfer
MÜNCHEN	17. Juni 2002	Tillgren, M

KATEGORIE DER GENANNTEN DOKUMENTE

X : von besonderer Bedeutung allein betrachtet
Y : von besonderer Bedeutung in Verbindung mit einer anderen Veröffentlichung derselben Kategorie
A : technologischer Hintergrund
O : nichtschriftliche Offenbarung
P : Zwischenliteratur

T : der Erfindung zugrunde liegende Theorien oder Grundsätze
E : älteres Patentdokument, das jedoch erst am oder nach dem Anmeldedatum veröffentlicht worden ist
D : in der Anmeldung angeführtes Dokument
L : aus anderen Gründen angeführtes Dokument

& : Mitglied der gleichen Patentfamilie, übereinstimmendes Dokument

EPO FORM 1503 03.82 (P04C03)

ANHANG ZUM EUROPÄISCHEN RECHERCHENBERICHT
ÜBER DIE EUROPÄISCHE PATENTANMELDUNG NR.

EP 02 01 0603

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten europäischen Recherchenbericht angeführten Patentdokumente angegeben.
Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am
Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

17-06-2002

Im Recherchenbericht angeführtes Patentdokument		Datum der Veröffentlichung	Mitglied(er) der Patentfamilie		Datum der Veröffentlichung
EP 1006704	A	07-06-2000	AU	5828799 A	11-05-2000
			EP	1006704 A2	07-06-2000
EP 1054329	A	22-11-2000	DE	19922974 A1	23-11-2000
			EP	1054329 A2	22-11-2000
WO 0131509	A	03-05-2001	AU	1344301 A	08-05-2001
			WO	0131509 A2	03-05-2001
EP 1061714	A	20-12-2000	DE	19927280 A1	11-01-2001
			EP	1061714 A2	20-12-2000
EP 0957674	A	24-11-1999	AU	727698 B2	21-12-2000
			AU	4798697 A	15-05-1998
			AU	731574 B2	05-04-2001
			AU	7355698 A	31-05-1999
			BR	9814101 A	03-10-2000
			CA	2309048 A1	20-05-1999
			CN	1276700 T	13-12-2000
			EE	200000165 A	16-04-2001
			EP	0957674 A1	24-11-1999
			EP	1024688 A1	09-08-2000
			HU	0004041 A2	28-03-2001
			JP	2001522591 T	20-11-2001
			NO	991963 A	22-06-1999
			NO	20001996 A	19-06-2000
			PL	340046 A1	15-01-2001
			WO	9923873 A1	20-05-1999
			SK	5692000 A3	07-11-2000
			TR	200001914 T2	22-01-2001
			US	6182725 B1	06-02-2001
			US	6341632 B1	29-01-2002
			NZ	335923 A	26-01-2001
			WO	9817099 A1	30-04-1998

EPO FORM P0461

Für nähere Einzelheiten zu diesem Anhang : siehe Amtsblatt des Europäischen Patentamts, Nr 12/82

Method and Apparatus for Autocompletion of Telephone Numbers with Database Look up

Patent number:	EP1259051
Publication date:	2002-11-20
Inventor:	SCHMIDT THORSTEN (DE); STEUER MANFRED (DE)
Applicant:	TENOVIS GMBH & CO KG (DE)
Classification:	
- international:	H04M1/2745; G06F17/27
- european:	G06F17/27P; H04M1/2745M; H04M1/56; H04M3/44; H04M3/493D
Application number:	EP20020010603 20020510
Priority number(s):	DE20011023045 20010511

Also published as:

DE10123045 (A

Cited documents:

EP1006704
EP1054329
WO0131509
EP1061714
EP0957674

Report a data error he

Abstract of **EP1259051**

Whilst entry is still incomplete, the telecommunications unit (1) initiates a search for the corresponding complete number or name. From the result, a completed entry is suggested by the display (5). An independent claim is included for corresponding telecommunications equipment.

Fig. 1
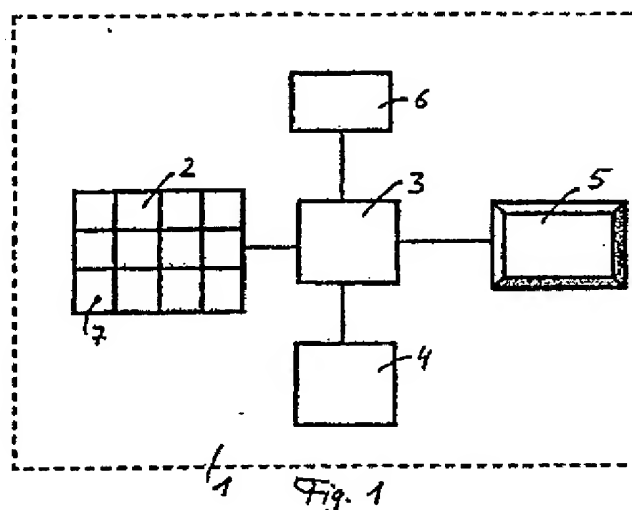
Data supplied from the *esp@cenet* database - Worldwide

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(54) Title: CIRCUIT-SWITCHED CALL SETUP USING A PACKET-SWITCHED ADDRESS SUCH AS AN INTERNET ADDRESS OR THE LIKE

(57) Abstract

The present invention provides a method and apparatus for setting up a telephone connection using an email address or the alike. In accordance with one aspect of the invention, a character string is entered into an electronic system (1301). The system transparently switches to NET mode (1303), connects to the net (1305) and sends an email request to an automailer (1307). The system then waits for a response from the automailer (1309, 1311). The system gets the reply with the requested number (1313) and disconnects from the net (1315). The system switches back to PHONE mode, displays the phone number and enters it in the phone scratchpad (1317), and then sends the phone number (1319).

CIRCUIT-SWITCHED CALL SETUP USING A PACKET-SWITCHED ADDRESS SUCH AS AN INTERNET ADDRESS OR THE LIKE

The present invention relates to telephone and computer communications.

With the advent of multimedia computers, considerable activity has occurred in computer telephony. In computer telephony, computer capabilities are used to make telephone communications easier. Different products have achieved different levels of integration between computer and telephone.

In one product category, personal computers, incremental progress continues to be made toward the integration of telephony functions. The most noticeable development has been the advent of the Internet phone, i.e., software for carrying out full-duplex voice communications across the Internet.

In a second product category, smart deskset telephones, various products have begun to emerge, including smart phones from such companies as Philips and Intelliphone.

In a third product category, smart cellular phones, smart cellular phones integrating voice and data communications have begun to become available from such companies as AT&T, Mitsubishi, and Nokia. The PocketNet™ phone from AT&T provides for Internet access using HDML, or Hyper-Device Markup Language. HDML, developed by Unwired Planet Inc. of Redwood City, CA, acts as an intermediary between small devices such as cellular telephones and the Internet at large. The PocketNet phone is software-upgradeable.

A perspective view of the PocketNet phone is shown in Figure 1. The phone may be placed in either a PHONE mode or a NET mode. Figure 2 is a partial perspective view of the phone in PHONE mode. The phone is provided with a display 201 and a keypad 203. Keys within a first row 205 of the keypad are "softkeys," i.e., keys whose function varies according to operation of the phone and whose function is displayed in a display area above the key. Cursor keys and navigation keys 207 (HOME, CLR, BACK and HELP) are provided in the following

1

SUBSTITUTE SHEET (RULE 26)

two rows. In a further row 209 are provided device control keys (SEND, POWER and END).

The keypad has different modes—alpha, numeric and symbol—that are coordinated with the operational mode of the phone. In some circumstances, the keypad may be switched between modes, for example by pressing a center one of the soft keys. In PHONE mode, the keypad is automatically placed in (and cannot be changed from) numeric mode. Figure 3 shows the phone following entry of a telephone number 301. The number is called by pressing the SEND key 303. The call is discontinued by pressing the END key 305.

The phone of Figure 1 provides a directory in which names and numbers may be stored. The number may be a telephone number or an IP address. A telephone number may be automatically dialed by retrieving a directory entry and pressing SEND. However, if no number has been stored in the entered directory location, or if the location contains data other than a phone number (such as an IP address), then no call will be made, and an advisory message will appear in the display.

None of the foregoing products has yet achieved significant market penetration. Computers and telephones therefore, although merging, remain largely separate.

The adoption of email, on the other hand, has occurred at a much more rapid pace. Of routine computer users, most now have or soon will have an email address. Many have more than one email address, e.g, one for work and another for home. Email offers unparalleled convenience of written communication. The convenience of email does not, however, eliminate the need or desire for other modes of communication, including voice, fax and pager communications.

U.S. Patent 5,239,577 to Bates et al., incorporated herein by reference, relates to a telecommunications network architecture and connection routing method for establishing cross-media (e.g., phone, cellular phone, fax, email) and

2

cross-context (e.g, residence, business) connections. The proposed system and method, however, are unduly complex, both from the standpoint of required infra-structure and user interaction. A linking database, or "directory of directories," is maintained that includes one entry per subscriber, each of whom is identified by a unique personal identification number. The entry contains a table of pointers for various media/context combinations. The pointers point to various databases in which corresponding "addresses" (character strings to be used in establishing con-nections of various types) may be found. By providing the unique personal identi-fication number of the person desired, a pointer to a database containing the desired address may be obtained, which database may then be queried in order to obtain the address itself.

However, as a preliminary matter, a database lookup must first be per-formed to obtain the unique personal identification number. This lookup is per-formed using a Line Identification Database (LDB) that provides a mapping between phone numbers and subscribers (identified by personal identification number) to which the phone numbers are assigned. The sequence of operations is therefore as follows: look up in the LDB, by telephone number, the unique per-sonal identification number of the desired party; look up in the linking database, by personal identification number, a pointer to a database containing an address in the desired context; and finally look up the address in the desired context.

In addition to being unduly complex, the foregoing system is "person-cen-tric." It does not make provision for discovering business addresses where the desired person is not known.

What is needed, therefore, is a way to achieve the convenience of email in others forms of telephonic communication.

The present invention, generally speaking, provides a method and appara-tus for setting up a telephone connection using an email address or the like. In many cases, an email address or other Internet address such as a URL may be eas-

3

SUBSTITUTE SHEET (RULE 26)

ily remembered or, in the case of a company, for example, may often be correctly guessed, whether the company is local, out-of-state, or in another country. Telephone numbers, on the other hand, are remembered only with considerable difficulty, and can be guessed correctly only through clairvoyance. (In fact, memory experts that have astounded audiences by memorizing large portions of the local telephone directory have done so by converting the numbers to words or phrases using a set of rules.) In accordance with one aspect of the invention, a character string is entered into an electronic system such as a personal computer, a deskset smartphone, or a cellular smartphone. A determination is made as to whether or not the character string is a telephone number. If so, a desired telecommunications connection is established directly using the phone number. If not, a preliminary telecommunications connection is established using the character string. The preliminary telecommunications connection may be to a mail server or a Web server, for example. During the course of the preliminary telecommunications connection, a telephone number is received. Preferably, the first thing the user receives back is what the users wants—a phone number—without any intermediate interaction. The telephone number is then used to establish the desired telecommunications connection. Telephone numbers are preferably "self-listed," i.e., stored in accordance with a naming convention on the email or other server. The method may be entirely automated to achieve in effect an Internet-based, world-wide, distributed telephone directory. The entities listed in the directory may themselves determine listing content and access policies.

Figure 1 is a perspective view of a known cellular telephone;

Figure 2 is a partial perspective view of the cellular telephone of Figure 1 with PHONE mode selected;

Figure 3 is a partial perspective view of the cellular telephone of Figure 2 following entry of a telephone number;

Figure 4 is a partial perspective view of a modified cellular telephone with PHONE mode selected;

4

Figure 5 is a partial perspective view of the modified cellular telephone of Figure 4 following entry of an email address instead of a telephone number for purposes of placing a voice call;

Figure 6 is a partial perspective view of the modified cellular telephone of Figure 4 following entry of a URL instead of a telephone number for purposes of placing a voice call;

Figure 7 is a first screen display displayed in response to the entry of the URL;

Figure 8 is a screen display displayed subsequent to the screen display of Figure 7;

Figure 9 is a screen display displayed subsequent to the screen display of Figure 8;

Figure 10 is a block diagram illustrating a computer the operating system of which has a communications extension and which is loaded with various communications programs;

Figure 11 is a block diagram illustrating an email server including an automailer that may be used to mail back a telephone number in response to an incoming mail message;

Figure 12 is a block diagram illustrating a Web server on which a hierarchy of directory pages is stored;

Figure 13 is a flow chart of processing steps for establishing a circuit-switched connection using an email address or the like;

Figure 14 is a flow chart of processing steps for establishing a circuit-switched connection using a URL or the like; and

Figure 15 is a screen display displayed during operation of a computer in accordance with one embodiment of the present invention.

One possible embodiment of the present invention is a cellular phone like the cellular phone of Figure 1. Referring to Figure 4, a perspective view is shown of a cellular phone 400 modified in accordance with the teachings of the present invention. The cellular phone is in the PHONE mode and is ready to accept a phone number or, as described herein, another identifier. The cellular phone 400 has a display 401, and a keypad 403 including row 405, row 407 and row 409.

An object of the present invention is to allow an email address, URL or

5

other identifier to be freely substituted for a phone number, a fax number, a pager

number, etc., while requiring minimal if any additional steps on the part of a user.

In some instances, hardware limitations may require additional steps. In the case of

the cellular phone of Figure 1 and the modified cellular phone of Figure 4, for

example, keypad limitations may require additional steps. In particular, where key-

pad modes are used to enable a common set of keys to perform diverse functions, a

keypad mode selection step may be required on the part of the user, in addition to

the steps the user would normally perform. Using an alternative input device, this

limitation may be avoided. One such input device, for example, is described in

PCT Application PCT/US96/18517 entitled TOUCH-SENSITIVE INPUT

DEVICE, METHOD AND SYSTEM THAT MINIMIZES THE NEED FOR

MEMORIZATION, filed November 18, 1996 and incorporated herein by refer-

ence.

Using a conventional keypad, prior to entering a non-numeric identifier

where a numeric identifier would ordinarily be expected, the user is required to

switch keypad modes. In the modified cellular phone of Figure 4, therefore, in the

PHONE READY condition, the center soft key within the row 405 is configured to

change the keypad mode from numeric to alpha while still remaining in the

PHONE operational mode. The user may then enter an identifier such as an email

address 501 as shown in Figure 5. When the identifier has been entered, the user

presses the SEND key 503 in the usual manner, and later disconnects by pressing

the END key 505, also in the usual manner.

In other embodiments of the invention, the cellular phone may be provided

with a dedicated e-dial key. Pressing the key the first time prompts the user to enter

an identifier. Pressing the key again causes the following series of steps to be per-

formed.

Subsequent to the user's pressing the SEND key (or other appropriate key),

the cellular phone performs a series of steps as shown in Figure 13. The cellular

6

phone, having received the email address input by the user (1301), transparently switches to NET mode 1303), connects to the net (Internet, intranet, or extranet 1305) and sends an email request to an automailer at an email address that is a predictable variant of the entered email address (1307). The cellular phone then waits for a response from the automailer (polling loop 1309, 1311).

As shown in Figure 11, the automailer 1101 is installed on an email server 1103. It handles mail addressed, for example, to user@ed.company.com, where ed stands for e-dial™ (or user@ed.school.edu, user@ed.agency.gov, user@ed.network.net, etc.). The automailer has access to a database 1105 containing a directory listing for each person within the directory various "comm" numbers, i.e., phone, fax, cellular phone, pager, etc. The email server 1103 (and possibly other servers 1107) are connected via the net 1109 to a communications gateway 1111. The communications gateway 1111 is coupled to a cellular base station 1113, which communicates with cellular phones including the cellular phone 1115.

Referring again to Figure 13, the automailer, when it receives the email from the cellular phone, looks up the requested number of the person to whom the email address belongs and immediately mails this number back to the cellular phone. (As described more fully in relation to Figure 10 below, which of several possible numbers is desired may be clear from context or, if not clear from context, the user may be requested to specify in advance which number is desired.) The cellular phone gets the reply with the requested number (1313) and disconnects from the net 1315). In like manner as shown in Figure 3, the phone then, still unbeknownst to the user, switches back to PHONE mode, displays the phone number and enters it in the phone's scratchpad (1317), and then sends the phone number (1319). Operation then proceeds as in the case of a conventional call. The user may save the retrieved phone number (saved in the scratchpad) in the phone directory, if desired.

The phone number may be included in the reply email message in any

7

number of ways. For example, since neither the original email message nor the reply message is intended to be read, the subject header field may be used for messaging purposes. In the reply message, the desired phone number may therefore be placed in the subject field, for example. The remainder of the reply message may be ignored, and the reply message may be automatically deleted.

In accordance with a further feature of the present invention, the originating station may further include in the subject-field identifier the country code and area code of the user. The automailer may then compare the country code and area code to the country code and area code in its locale, or to the country code and area code of a number stored in the database. On this basis, the automailer is able to send the desired phone number with or without country code and with or without area code (even with or without out-dial code), depending on whether they are likely to be required by the user in order to establish a connection using the phone number.

In some instances, the number may not be available, i.e., it may not have been "self-listed" by the person or company. In such an instance, the call cannot be completed, and an advisory message is displayed. In one embodiment, the advisory message includes links to one or more centralized directory services, such as the Four-One-One Web page, etc. If desired, the user may then attempt to locate the desired number through these alternative means.

The identifier, instead of an email address, may be a URL, for example, or other identifier. Whereas email addresses are person-specific, URLs are often company-specific. Hence, if a user wishes to contact an individual by phone, fax, or pager, for example, the user may enter the email address of that individual. If a user wishes to contact a company by phone, fax, etc., the user may enter a URL 601 of a company, as shown in Figure 6.

When the cellular phone is in PHONE mode and the user enters a URL and presses the SEND button 603, a similar sequence of operations occurs as previ-

SUBSTITUTE SHEET (RULE 26)

ously described. Referring to Figure 14, the cellular phone, having received the URL input by the user (1401), transparently switches to NET mode (1403), connects to the net (1405), sends an request to a server for a page the URL of which is a predictable variant of the entered URL (1407), and waits for a response from the server.

As shown in Figure 12, a Web server 1203 has access to storage 1205 containing a series of linked directory Web pages. One of the Web pages may have a URL such as www.company.com/ed (where ed stands for e-dial™). The Web server 1203 (and possibly other servers 1207) are connected via the net 1209 to a communications gateway 1211. The communications gateway 1211 is coupled to a cellular base station 1213, which communicates with cellular phones including the cellular phone 1215.

Referring again to Figure 14, the server responds to the request in the usual manner by sending a page back to the cellular phone. The cellular phone displays the page (1409), an example of which is shown in Figure 7. The page will be the first page in the hierarchy of directory pages, organized by function, for example. In the example of Figure 7, the first page presents within a first column generic sub-divisions of a typical company (e.g, accounting, corporate, engineering, human resources, etc.). In the second column are presented corresponding telephone and fax numbers.

If the desired number is found at this general level, the user may cursor to the desired number to select it (1411) and press SEND. The phone then, still unbeknownst to the user, disconnects from the net (1415), copies the selected number (1417), switches back to PHONE mode (1419) and sends the phone number (1421). Operation then proceeds as in the case of a conventional call. The user may save the retrieved phone number in the phone directory, if desired.

If the user desires a more specific number, the user may cursor to any heading and press SEND. Each heading is a link that causes a more specific page relat-

9

ing to that heading to be retrieved and displayed. In the example of Figure 7, the SALES/MARKETING heading has been selected, resulting in a more specific page being retrieved and displayed as shown in Figure 8. Hence, as shown in Figure 14, if the selection is a link (1413), another request is sent (1407), etc.

As with conventional Web browsers, there need be no limit to the number of levels of hierarchy. Assume that the user, presented with the page of Figure 8, still has not found the desired number. The user might select still a further heading, resulting in the display of still a further page as shown in Figure 9. As the depth within the hierarchy increases, the content of the page and resulting display may change, for example to display names of individuals at the leaf level of the hierarchy if the hierarchy is sufficiently detailed. If the number ultimately selected by the user is accompanied by a name, then preferably the name is displayed in addition to the selected number, to allow the user the opportunity of entering both the name and the number into the phone directory. (Of course, department names may also be displayed and entered into the phone directory if desired.)

Software for the e-dial service includes client software and server software. In one embodiment of the invention, support for the client software is provided within a standard protocol for wireless devices, such as the Wireless Application Protocol (WAP). The server software may be tailored for use by ISPs (Information Service Providers). An ISP may offer the e-dial service for free, as part of a premium service package, or on a per-use basis.

More preferably, a group of ISPs may jointly offer the e-dial service and coordinate billing. The benefit of the e-dial service is felt most keenly by the calling party. The benefits to the called party of being more easily reachable may be less apparent. If a per-use charge is to be levied, then most if not all of the charge should be made to the calling party, but the calling party is likely to not be a customer of the ISP and hence cannot be conveniently billed by the ISP. However, the calling party is likely to be a customer of a different ISP. If an agreement exists

10

between the ISPs, then the calling party's ISP can charge and collect from the calling party and remit all or a portion of the charge to the called party's ISP for providing the underlying service. Settlement between the ISPs would occur based on a large number of aggregated transactions.

Preferably, each ISP subscriber is offered a Web-based interface to allow the subscriber to enter and update phone number information. For example, a subscriber may choose to make the subscriber's cellular phone number available in addition to the user's regular phone number. At some later date, the subscriber may decide that the number of cellular telephone calls being received exceeds the number that the subscriber wishes to receive. The subscriber would then log on to gain access to the subscriber's account and would delete the cellular telephone number.

The invention may also be used in conjunction with a deskset smartphone. In this instance, keypad limitations are removed, such that the object may be fulfilled of allowing an email address, URL or other identifier to be freely substituted for a phone number, a fax number, a pager number, etc., without requiring any additional steps on the part of a user.

Similarly, the invention may be used in conjunction with a computer. Referring to Figure 10, a computer 1001 is connected through a switched network 1003 (e.g., the Public Switched Telephone Network) to the net (1005). Connected to the net 1005 are various servers 1007. The computer 1001 is preferably a multimedia computer having at least one speaker 1009, a microphone 1011, a CD-ROM or DVD drive (not shown), etc.

Installed on the computer 1001 is software including an e-dial™ Operating System Extension (OSX) 1013 and various e-dial enabled communications packages, including, for example, phone software 1015, fax software 1017, paging software 1019, etc.

When a "comm" number is to be input to an e-dial-enabled comm application, the application makes a call to the e-dial OSX. The call includes sufficient

11

DCID: <WO_____9835481A3_IA>

information to allow the operating system to display an identifier entered by the user within the appropriate field on the display screen. An e-dial icon may be displayed alternately with the icon of the comm application on screen within an application bar area, as shown in Figure 15. The e-dial OSX then proceeds to receive the user-input identifier and display it in the appropriate field. The identifier may have a length exceeding the length of the field, in which case a known scrolling behavior within the field is exhibited.

As the identifier is being input, the OSX checks the identifier to determine whether it is strictly a numeric identifier or whether it is primarily an alpha identifier, looking particularly for the substring "www", the "@" character, etc. When the OSX receives a terminating character, if the identifier has been determined to be strictly numeric, the OSX returns the identifier to the comm application, operation of which proceeds as normal.

If the identifier has been determined to be an email address used in a non-email context, for example, the OSX, without substantially altering a majority of the display area, opens an email component in order to perform the operations depicted in Figure 13. During lookup of the desired phone number, the entered identifier may be flashed on the screen to signal the user that lookup is proceeding.

If the desired phone number is obtained, it is returned to the comm application, which inserts it in the appropriate field and proceeds with operation as normal. If the desired phone number is not obtained, then the OSX blanks the field and shows an alert, informing the user that the number could not be obtained.

Phone numbers may be cached locally on the computer in correspondence to the alphanumeric strings by which they were retrieved. A cache of phone numbers may be built up and maintained using an LRU (Least Recently Used) or other suitable strategy. In this manner, alphanumeric strings may be used to call frequently-called parties without incurring the lookup overhead previously described.

If the identifier is determined to be a URL or the like (entered in a non-Web

12

context), then operation proceeds as shown in Figure 14. Assuming that a first directory screen is obtained, a window is opened and the directory screen is displayed. If the user selects a phone number, then the window that was opened is closed, and that number is inserted into the appropriate field within the display screen of the comm application. The OSX then returns control to the comm application.

If the user selects an item other then a phone number, then a link is followed to retrieve and display a next directory screen, if any. Preferably, a BACK button is also provided to allow the user to traverse the directory structure in a familiar manner. If the desired phone number is not found, the user selects a close button to cause the window to be closed. The field within the comm application then remains blank. The user may then resort to alternative means to try to find the desired phone number.

If the desired phone number is not found, it may be because e-dial is not supported at the site in question or because, although e-dial is supported at the site, either the information at the site is not current or the information of the user in expecting the number to be at the site is not current.

If e-dial is not supported at the site, an email notification may be sent, e.g, to "postmaster" or "webmaster", that an attempt was made to use e-dial to contact someone at the site, together with information as to where e-dial software may be obtained. If e-dial is supported at the site, an email notification may be sent to the automailer. In response to the notification, the automailer may send an email form to the person whose number was not found, such that by completing and returning the form that person may then be listed.

The invention, in somewhat modified form, may also be used with a two-way pager. The use of an email address to facilitate establishment of a circuit-switched call will be described, although a URL or other identifier could likewise be used.

13

Known two-way pagers are capable of sending both pages and email. Insofar as these two modes of communication are concerned, the invention may be used without modification. Two-way pagers, however, are not presently capable of telephonic communications. Nevertheless, with appropriate modifications, a two-way pager may be used to readily obtain a desired telephone number that may then be dialed from a cellular or conventional telephone.

For example, the two-way pager may be provided with a special-purpose button, hard or soft (referred to herein as an "e-dial" button) which when pressed, readies the two-way pager to have input an email address. To facilitate entry of such addresses, preferably the two-way pager is provided with an input device such as that described in the aforementioned PC T application or with other suitable input means, such as the T9™ input system of Tegic Communications, Inc. of Seattle, Washington.

When the user has finished inputting the email address, the e-dial button is again pressed. The two-way pager then functions in a similar manner as in the embodiments previously described, to send an email message and receive an email reply, and to automatically extract from that email reply the desired phone number.

Because the two-way pager (presumably) lacks telephonic communications, it cannot use the phone number to establish a circuit-switched connection. Instead, the two-way pager displays the phone number to the user. The number may be stored in a directory of the pager if desired. The pager may also be equipped with autodial capabilities such that the user may hold the pager next to the microphone of a landline telephone and again press the e-dial button to cause the pager to produce appropriate tones in order to dial the number.

14

What is claimed is:

1.   A method of retrieving desired phone number information using an network protocol, comprising the steps of:

a user entering into the electronic device a network address of a party whose phone number information is to be retrieved;

the electronic device sending a request to a server in accordance the network protocol, the request containing a predictable variant of said address; and

the server sending the desired phone number to the electronic device.

2.   The apparatus of Claim 1, wherein the desired phone number information is a single phone number, comprising the further step of the electronic device automatically dialing the desired phone number.

3.   The apparatus of Claim 1, wherein the desired phone number information is a hypertext phone directory page, comprising the further step of the electronic device displaying the hypertext phone directory page.

4.   The apparatus of Claim 3, comprising the further steps of:

the user selecting a link within the hypertext phone directory page; and

the electronic device cooperating with the server to retrieve and display a further hypertext phone directory page.

5.   The apparatus of Claim 3, comprising the further steps of:

the user selecting a single phone number within the hypertext phone directory page; and

the electronic device automatically dialing the selected phone num-

15

SUBSTITUTE SHEET (RULE 26)

ber.

6.   A method of establishing a desired telecommunications connection, comprising the steps of:

inputting a character string entered by a user;

determining whether or not the character string is a telephone number;

if the string is a telephone number, establishing the desired telecommunications connection directly using the telephone number;

if the character string is not a telephone number, establishing a preliminary telecommunications connection using the character string;

receiving a telephone number during the course of the preliminary telecommunications connection; and

using the telephone number to establish the desired telecommunications connection.

7.   The apparatus of Claim 6, wherein the character string is a an email address and the preliminary telecommunications connection is established with an email server in accordance with an email protocol such as Simple Mail Transfer Protocol.

8.   The apparatus of Claim 6, wherein the string is a resource locator and the preliminary telecommunications connection is established with a hyper-media server in accordance with a hyper-media protocol such as Hyper-Text Transfer Protocol.

9.   An electronic system comprising:

a data processing core, including memory;

coupled to the data processing core:

a modem;

16

a circuit-switched telecommunications transceiver;

a packet-switched telecommunications transceiver; and

I/O circuitry;

the combination further comprising stored program instructions within memory including instructions for:

inputting a character string entered by a user;

determining whether or not the character string is a telephone number;

if the string is a telephone number, establishing the desired telecommunications connection directly using the telephone number;

if the character string is not a telephone number, establishing a preliminary telecommunications connection using the character string;

receiving a telephone number during the course of the preliminary telecommunications connection; and

displaying the telephone number or using the telephone number to establish the desired telecommunications connection.

10.   The apparatus of Claim 9, wherein the electronic system is a smart cellular telephone.

11.   The apparatus of Claim 9, wherein the electronic system is a personal computer coupled to the public switched telephone network.

12.   The apparatus of Claim 9, wherein the electronic system is a smart deskset telephone coupled to the public switched telephone network.

13.   An electronic system for use in establishing a desired telecommunications connection, comprising:

17

SUBSTITUTE SHEET (RULE 26)

a data processing core, including memory;

coupled to the data processing core:

a packet-switched telecommunications transceiver; and

I/O circuitry;

the combination further comprising stored program instructions within memory including instructions for:

receiving an address of a desired party entered by a user into the electronic device;

sending a request to a server in accordance with an Internet protocol, the request containing a predictable variant of said address; and

receiving from the server a communications string of the desired party.

18

SUBSTITUTE SHEET (RULE 26)
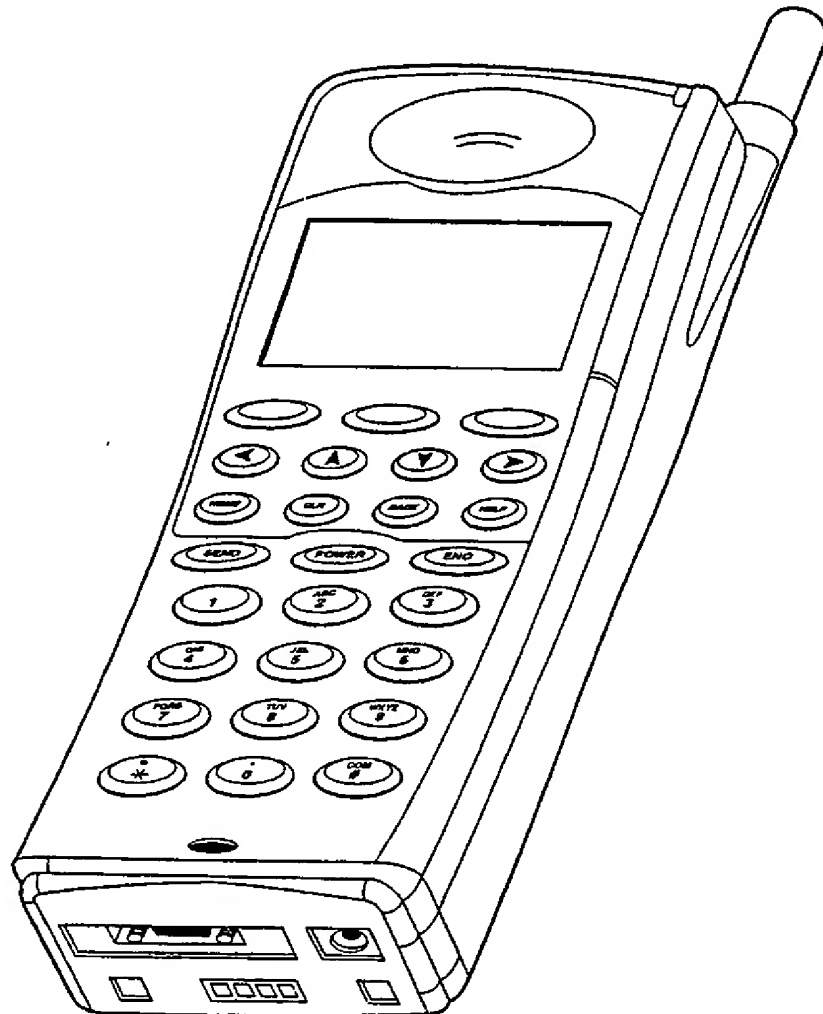
Fig. 1
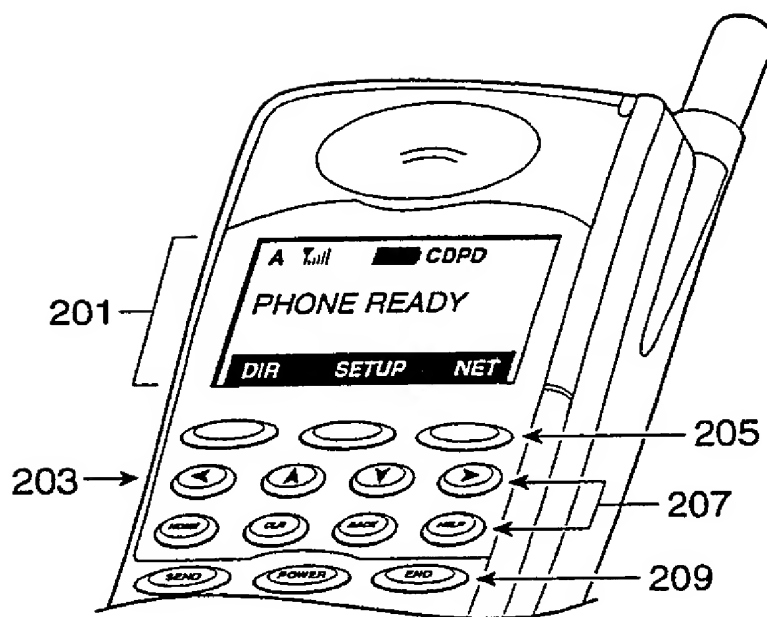
(PRIOR ART)

Fig. 2

(PRIOR ART)
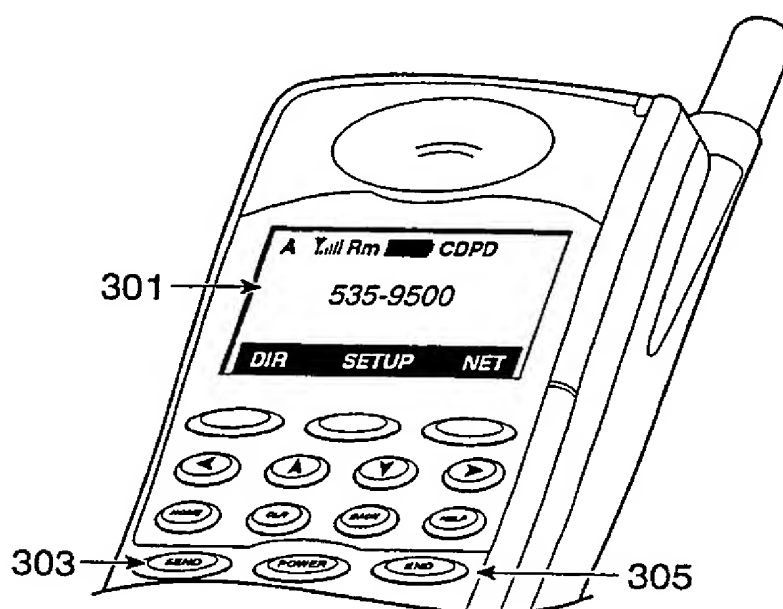
Fig. 3

(PRIOR ART)

401

405

403

407

409

A T₁₁₁₁   CDPD

PHONE READY

DIR   1→A   NET

Fig. 4

Fig. 5

XCID: <WO_____9835481A3_IA>
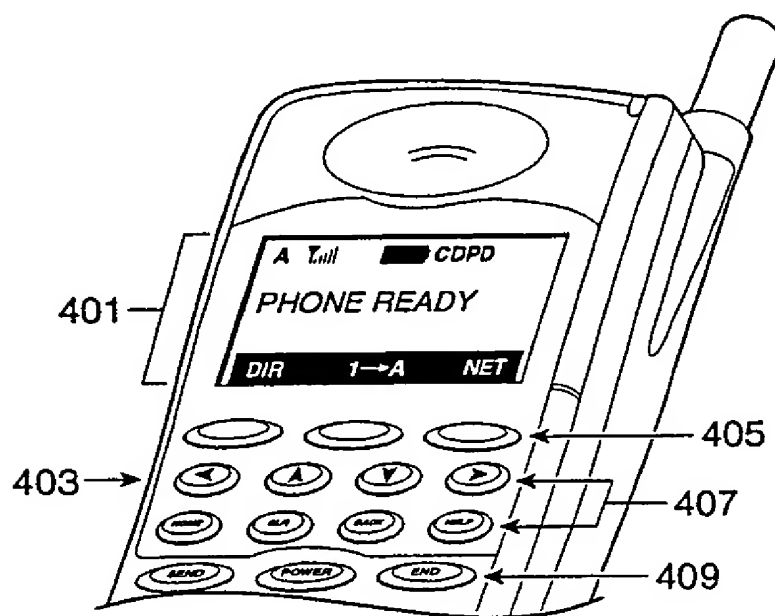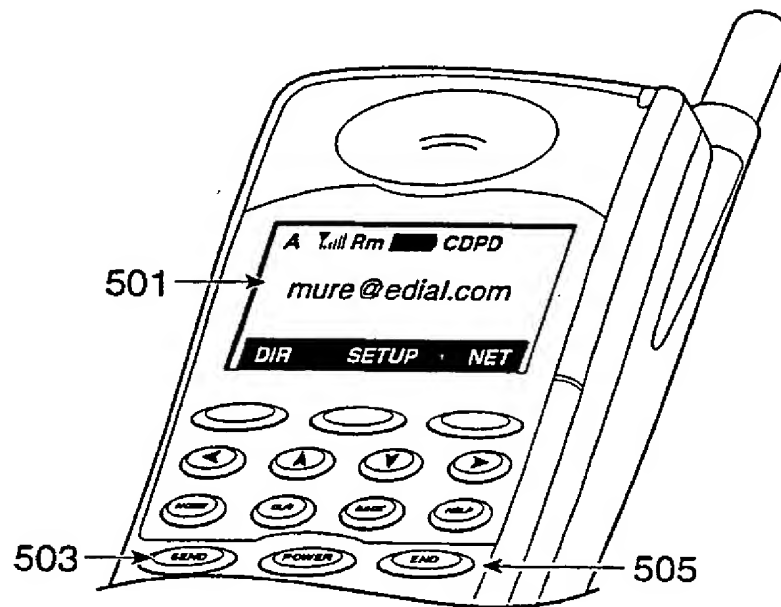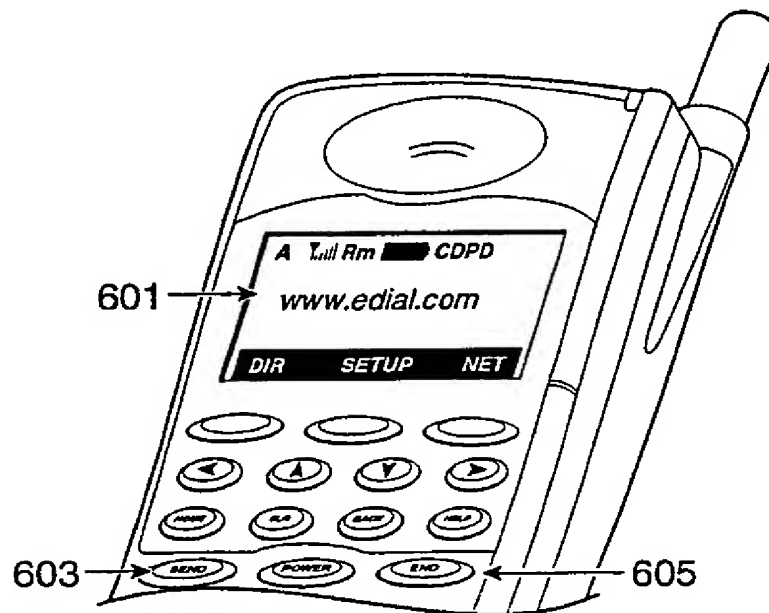
Fig. 6

e-dial, Inc.
10518 Phil Place
Cupertino, CA 95014
(408) 255-4800
(800) 337-6640

DEPARMENT	PHONE	FAX
Accounting	(408) 255-4815	(408) 255-4892
Corporate	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Engineering	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Human Resources	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Legal	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Sales/Marketing	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Technical Assistance	(xxx) xxx-xxxx	(xxx) xxx-xxxx

Figure 7

e-dial, Inc.
10518 Phil Place
Cupertino, CA 95014
(408) 255-4800
(800) 337-6640

SALES/MARKETING DEPARMENT

OFFICE	PHONE	FAX
Pacific	(408) 255-4815	(408) 255-4892
Midwest	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Northeast	(xxx) xxx-xxxx	(xxx) xxx-xxxx
European	(xxx) xxx-xxxx	(xxx) xxx-xxxx
International	(xxx) xxx-xxxx	(xxx) xxx-xxxx

Figure 8

e-dial, Inc.
10518 Phil Place
Cupertino, CA 95014
(408) 255-4800
(800) 337-6640

PACIFIC SALES/MARKETING

NAME	PHONE	FAX	E-MAIL	CELL	PAGER
Home, Glen	(408) 255-4815	(408) 255-4892	g.horne@edial.com	(408) 290-2906	(800) 408-6195
xxxxx, xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
xxxxx, xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
xxxxx, xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
xxxxx, xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx

Figure 9

Fig. 10

Fig. 11

user@ed.company.com
user@ed.school.edu
user@ed.agency.gov
user@ed.network.net

1213

1215

GW

1211

NET

1209

www.company.com/ed
www.school.edu/ed
www.agency.gov/ed
www.network.net/ed

Fig. 12

1207

WEB
SERVER

1203

1205

```
          ( EMAIL ADDR. )
                |
                v
        +------------------+
        | RECEIVE EMAIL    |
        | ADDR. INPUT      |   1301
        | BY USER          |
        +------------------+
                |
                v
        +------------------+
        | SWITCH TO        |   1303
        | NET MODE         |
        +------------------+
                |
                v
        +------------------+
        | CONNECT TO       |   1305
        | INTERNET/INTRANET|
        +------------------+
                |
                v
        +------------------+
        | SEND REQUEST     |
        | (PHONE, FAX,     |   1307
        | PAGE, ETC.) TO   |
        | user@ed.ABC.XYZ  |
        +------------------+
                |
        +-------v----------+
        | CHECK FOR REPLY  |   1309
        +------------------+
                |
                v
             / REPLY? \          1311
             \        /
                |
                v
        +------------------+
        | GET REPLY        |
        | WITH REQUESTED   |   1313
        | NUMBER           |
        +------------------+
                |
                v
        +------------------+
        | DISCONNECT       |   1315
        +------------------+
                |
                v
        +--------------------+
        | SWITCH TO PHONE    |
        | MODE, DISPLAY      |   1317
        | NUMBER, ENTER      |
        | NUMBER IN          |
        | SCRATCHPAD         |
        +--------------------+
                |
                v
        +------------------+
        | SEND NUMBER      |   1319
        +------------------+
                |
                v
            ( RTN )
```

Fig. 13

XCID: <WO_____9835481A3 IA>

```
              ( URL )
                 │
                 ▼
      ┌──────────────────┐
      │  RECEIVE URL      │      1401
      │  INPUT BY USER    │
      └──────────────────┘
                 │
                 ▼
      ┌──────────────────┐
      │  SWITCH TO        │      1403
      │  NET MODE         │
      └──────────────────┘
                 │
                 ▼
      ┌──────────────────┐
      │  CONNECT TO       │
      │  INTERNET/        │      1405
      │  INTRANET         │
      └──────────────────┘
                 │
     ┌───────────▼────────────┐
     │ ┌──────────────────────┐│
     │ │  SEND REQUEST        ││
     │ │ (E.G., www.ABC.XYZ/ed)││   1407
     │ └──────────────────────┘│
     │          │              │
     │          ▼              │
     │ ┌──────────────────┐    │
     │ │  GET REPLY,       │   1409
     │ │  DISPLAY PAGE     │    │
     │ └──────────────────┘    │
     │          │              │
     │          ▼              │
     │ ┌──────────────────┐    │
     │ │  RECEIVE USER     │   1411
     │ │  SELECTION        │    │
     │ └──────────────────┘    │
     │          │              │
     │          ▼              │
     │      ◇─────────◇        │
     └──────│  LINK?  │  1413
            ◇─────────◇
                 │
                 ▼
      ┌──────────────────┐
      │  DISCONNECT       │      1415
      └──────────────────┘
                 │
                 ▼
      ┌──────────────────┐
      │  COPY NUMBER      │      1417
      └──────────────────┘
                 │
                 ▼
      ┌──────────────────┐
      │  SWITCH TO        │
      │  PHONE MODE,      │      1419
      │  ENTER NUMBER     │
      │  IN SCRATCHPAD    │
      └──────────────────┘
                 │
                 ▼
      ┌──────────────────┐
      │  SEND NUMBER      │      1421
      └──────────────────┘
                 │
                 ▼
              ( RTN )
```

Fig. 14

Fig. 15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/01419

A.	CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04M 1/00, 3/00, 3/42, 1/64, 1/56, 15/06, 11/00 .
US CL   :379/355, 211, 88, 142, 201, 354, 67, 93.23, 212, 210; 455/445, 461
According to International Patent Classification (IPC) or to both national classification and IPC

B.	FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. :   379/355, 211, 88, 142, 201, 354, 67, 93.23, 212, 210; 455/445, 461

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS
search terms: network address, computer, cellular phone, e-mail, database, directory, identify, internet

C.	DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,239,577 A (BATES et al) 24 August 1993, col. 3, line 54 to col. 4, line 18.	1-2
X,P	US 5,689,547 A (MOLNE) 18 November 1997, col. 2, line 10 to col. 4, line 40.	1-13

☐ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)		
"O"	document referring to an oral disclosure, use, exhibition or other means	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 JULY 1998	1 1 AUG 1998

Name and mailing address of the ISA/US	Authorized officer
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	KRISTA ZELE
Facsimile No. (703) 305-3230	Telephone No. (703) 305-4701

Form PCT/ISA/210 (second sheet)(July 1992)٭

(51) International Patent Classification[7]: **H04Q 7/22**

(21) International Application Number: PCT/GB00/02919

(22) International Filing Date: 28 July 2000 (28.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
9917723.0   28 July 1999 (28.07.1999)   GB

(71) Applicant *(for all designated States except US)*: INTELL-PROP LIMITED [—/—]; P.O. Box 626, National Westminster House, Le Truchot St Peter Port, Guernsey (GB).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: WILSON, Jeffrey

[GB/GB]; 53 Kiln Road, Fareham, Hampshire PO16 7OH (GB).

(74) Agent: D YOUNG & CO; 21 New Fetter Lane, London EC4A 1DA (GB).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(54) Title: TELECOMMUNICATIONS SERVICES APPARATUS
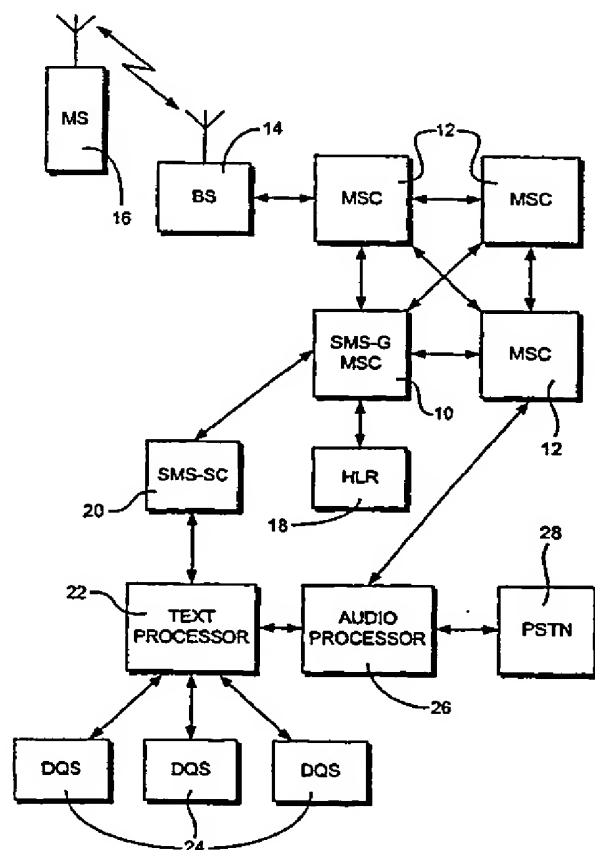
(57) Abstract: A telecomunications services apparatus for providing information in response to text message requests from a mobile terminal (16) includes a text processor (22) connected to the mobile network and to a data store (24) holding information such as directory enquiry information. The text processor (22) is also connected to an audio processor (26) which can provide audio signals such as processed speech or music. In response to a message request from the mobile terminal (16), the text processor (22) returns the associated information from the data store (24) and/or audio from the audio processor (26) to the mobile terminal (16) or to another terminal.

WO 01/08430 A1

WO 01/08430 A1

1

Telecommunications Services Apparatus

This invention relates to telecommunications services apparatus, and in particular to such apparatus which may be utilised to provide information upon request, such as in directory enquiries.

5   Traditional directory enquiries services on fixed and mobile telephone networks have a number of disadvantages. Typically a caller will only be given one or two numbers per call, and will often pay a significant charge for the service. The service is also not private, because the caller's request may be overheard by persons nearby. Also the caller often has to know the area or town where the company is based

10   before the directory service will help him. In some cases one can opt for existing directory services to complete the call to the number obtained, but this is usually at a high tariff. If the caller does not opt for connection, then he needs to write down, re-type or remember the number given.

This situation has arisen because directory services have historically been

15   based around the fixed network, which still predominantly uses handsets with limited functionality, and no easy means to enter and display text. This has required the use of large numbers of operators, which makes the directory service very expensive to run, and this cost is passed on to the users. The grade of service provided can also be poor at times, especially late at night, if the number of operators provided is low.

20   There are several different types of number for which directory enquiry services can be useful:

(1)   numbers of friends

(2)   numbers of business associates

(3)   national numbers of named companies

25   (4) ·   numbers of generic suppliers, e.g. glass, car insurance

(5)   local numbers for tradesmen, businesses etc

One network operator currently provides an e-mail service based on the Short Message Service (SMS).   The user's e-mail address is his mobile phone

30   number@<network operator>.net. To send an e-mail, the recipient address followed by the text of the message is entered as an SMS message and then sent to a short

(typically three digit) number which is the network operator's e-mail server. This allows SMS messages to be directed to the server, and portions of the content to be automatically stripped out and interpreted.

SMS technology allows alphanumeric entry using a standard handset, while the display provides user feedback. This is a good and well established interface for entering any kind of text or numbers into a mobile handset.

Handset technology also allows SMS messages received by the handset to have telephone numbers extracted from them. The number may be selected from those extracted and then dialled.

Databases are also known technology, where for example a telephone number can be looked up using a name as a key. For this to work on a large database, known hashing techniques are required to make the database searching efficient.

Companies can usually be found on the Internet simply by accessing www.<company>.com or www.<company>.co.uk (for a UK company.) This universal scheme is powerful but does not currently have any counterpart in the telephone network.

The present invention provides a telecommunications services apparatus for use in operative association with a telecommunications system, said telecommunications system having a plurality of communications terminals which provide a facility for telecommunications, said telecommunications apparatus comprising

-    a text processor coupled to said telecommunications system and also coupled to an associated data store which has stored therein information capable of association with data entered from a communications terminal and so organised that in response to data entered from a communications terminal the text processor will return the associated information from the data store to the said communications terminal and/or to another selected communications terminal.

A preferred embodiment of this invention makes it possible to quickly find out the telephone number of any company or organisation by using either the Short Message Service (SMS) currently available on mobile networks or any other means of sending text messages on current or future telephony networks. The system can also be used to retrieve other alphanumeric or audio information about the target organisation.

It is envisaged that this technique could be used initially for local and national numbers for named businesses, but could alternatively be used or extended to cover generic products and services. This allows the preferred apparatus to fulfil the needs currently covered by Business directories and Yellow Pages type directories at the local and national level.

The preferred apparatus may actually provide a better service than existing directory enquiries for these types of numbers. It removes some of the difficulties with existing directory services by making use of the features of SMS, which allow easy text entry and display. Directory enquiry style retrieval can be done quickly and silently from a mobile handset which makes the system convenient to use even in a public place. There is no need to remember or write down any numbers, and the system can return multiple numbers at once, complete with annotation and even advertising or special offers. It would not be necessary to know the location of the organisation whose number is required. The system can also optionally allow call completion so that the user can be connected directly to the organisation of his choice.

The service is very attractive for mobile operators and their customers, and can give a unique marketing advantage because it provides an improved version of business directory enquiries. It may also attract increased call revenue from SMS messages sent and calls completed. It requires no operators, and so is cost effective to run. It is also very attractive for the customers that are companies subscribing to the telephone number database, since their number will be immediately available to any customers of the mobile network who wish to contact them. Whereas a Yellow Pages type service is regional with many volumes covering the country, this service has the potential to support both regional and national directory access. Traditional directory services are static, and also very limited in the amount of information they provide. The present technique allows the directory information to be dynamic. The SMS message sent from the database could contain information about a current special offer for example in addition to telephone numbers, opening times, and services available. The messages could be geographically targeted, even down to the GSM cell level. For example, a customer who enters the text:

french restaurant

4

as his SMS message, could receive targeted details or offers from French restaurants in the vicinity.

In its preferred embodiment, the service uses SMS both for transmitting the request to the network and for delivering the number and other information back to the

5 user. Optional call completion could be achieved either by the network ringing back the caller, or by a handset modification which would allow an audio call to be set up in parallel with the requesting SMS message. Some handsets allow SMS messages to be composed, sent, received and read during a voice call, but most do not allow all of these at present.

10 Thus it will be apparent that the preferred technique provides a valuable service which can be made available on any mobile handset which can support SMS. While it has been possible for some considerable time on the Internet to find details of almost any major company simply by entering the URL (uniform resource locator) address www.<company>.com or www.<company>.co.uk (for a UK company) this is not

15 currently possible with the telephone network. Directory enquiries is a partial and often expensive solution, and usually requires the caller to know the location of the company in question. The preferred technique allows the user to find out the access-number which a company chooses to publish, quickly, silently and without having to know any more than the company name. The number is delivered back to the user by

20 SMS, from where the user can extract it and dial it. Alternatively automatic call completion can be offered.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying single figure drawing which shows a block diagram of a mobile telephone text processing and telecommunications services

25 system embodying the invention.

Referring to the drawing, a mobile telephone text processing system is shown associated with a telecommunications services system. The mobile telephone text processing system includes an SMS gateway mobile switching centre (MSC) 10 connected to a number of mobile switching centres 12, which are also interconnected.

30 One of the mobile switching centres 12 is shown connected to a base station 14 which is shown in radio communication with a mobile station 16. The SMS gateway MSC 10 is also connected to a home location register 18 and to an SMS service centre 20.

The SMS service centre 20 is connected to a text processor 22 which has access to one or more directory enquiry servers 24. The text processor 22 is also connected to an audio processor 26 which has access to one or both of a mobile switching centre 12 and to the public switched telephone network (PSTN) 28.

5   With reference to operation of the mobile telephoning text processing system, for an SMS message sent from a mobile station 16 via the base station 14, the receiving mobile switching centre 12 forwards the message directly to the SMS gateway MSC 10 which passes it on to the SMS service centre 20. If the SMS message is identified as one intended for the telecommunications services system, it is

10   sent to the text processor 22. For a return SMS message arriving from the SMS service centre 20 at the SMS gateway MSC 10, the mobile switching centre interrogates the home location register (HLR) 18 to determine the current location of the mobile station 16 for which the message is intended. The SMS message is then passed to the appropriate mobile switching centre 12 and sent via the respective base

15   station 14 to the mobile station 16.

When an incoming SMS message is recognised as a request for information, such as a directory enquiry, the message is sent to the (or the appropriate) directory enquiry server 24. A database in (or associated with) the DQS 24 is then checked for the relevant information which is sent back in SMS form as described above.

20   The preferred technique is also applicable to corporate or closed user group directories. By directing the SMS request to a different server, for example one operated by a company, an employee of the company could automatically be authorised by his CLI or handset identity, and then have directory access to a database of information, which could include telephone numbers, e-mail addresses, mobile

25   numbers, fax numbers etc. of other employees, customers, business associates and so on. The system is especially useful for telephone number retrieval since existing handset features allow telephone numbers to be extracted from SMS responses and dialled without the user having to remember or re-type the number.

The text processor 22 can be so organised using known string matching

30   techniques that partial, mis-spelt or otherwise incorrect inputs can be correctly interpreted and used to generate the desired output.

6

The system also allows audio information to be received by the user. One way to do this is for the SMS message to be sent to a different number, which would cause the directory lookup to access the world wide web page for the company name requested. An alternative is for the web address to be entered directly in the SMS

5   message. The system would then attempt to retrieve an audio file from the web site. This could be in a defined subdirectory e.g. /SMS . If this audio file was found then a call would be established to the mobile phone and the audio file would be transcoded if necessary and played to the user. If the audio file was not found then a standard message could be played by the system. Interaction could be possible during the audio

10   file play, opening up the possibility of all kinds of advertising and services. Typically the audio file would contain information or advertising about the company or service which the user has named, and this could be presented in parallel with the SMS reply described above.

As shown in the drawing, the audio processor 26 is coupled to the text

15   processor 22 such that, in response to an appropriate SMS request, the audio processor 26 generates and delivers information via either the mobile network or, if desired, via the PSTN 28 to a fixed network telephone.

SMS could also be used to select music to be played over the mobile network. With the advent of the Universal Mobile Telephony System (UMTS 2000) sufficient

20   data bandwidth will be available to the mobile terminal to allow the transfer of real-time hi-fi stereo audio, encoded for example as MPEG Layer 3 (MP3) which requires around 128 kbit/s. The combination of SMS with powerful search engines would enable users to find and select the music of their choice and have it played to them on demand, at any time or place. As an alternative, the system may allow for the audio to

25   be delivered to a different number, such as via a fixed network (PSTN 28). This different number could be included in the original SMS request, or enterd subsequently following an enquiry from the system.

The directory enquiry service as described above could be configured to provide other information and in particular the associated database could provide

30   language translation capability. There would then be no need to carry dictionaries as at all times translation could be provided quickly over the mobile telephone network. This is particularly relevant for many individuals who have some command of a

foreign language but still need to look up words from time to time. This capability could be so structured for one's native language so as to provide a word finder and/or anagram capability as found in current electronic word finder devices or some books which provide crossword solving assistance.

5   The concept can be further extended to any other information field, e.g. medicines, travel, tourism etc. and in such cases use of the handset would be much simplified if the SMS message could be sent to a destination that can be defined alphanumerically in addition to the current techniques of using numeric destinations (usually telephone numbers.) As an example the SMS message:

10   **aspirin**

could be sent to the destination:

       medicines

in order to retrieve information about this particular item.

      Another example of a possible use according to an embodiment of this

15 invention will now be described. A mobile network may offer as a service the provision of subscriptions from a large number of companies which entitle those companies to an entry or entries in a database operated by the mobile network. The database allows a text string containing one or more telephone numbers to be looked up, using the company name as a key, and returned by SMS to the requesting handset.

20   The service may, for example, be marketed as '*Easy-123*'. If, a mobile user wants to find out the customer enquiry number of, say, the Dodgem car company, he uses his mobile handset to enter an SMS message consisting of simply the text:

       dodgem

He then sends this SMS message to the number 123. An SMS message is then

25 returned by the server. The reply may typically contain the text:

      Dodgem UK: Book a test drive 0990 1234567. Helpdesk: 0800 1234567 9am-5pm, 7 days a week.

      If he decides to call the second number immediately, he can use his phone's SMS number extraction feature to pick out the number 0800 1234567 and dial it. He is

30 then connected to the desired Dodgem customer service line. The entire SMS message is also retained in the handset for future use.

Although the invention has been described in the context of particular embodiments, it will be apparent that it may be implemented in other ways. In particular, features of the invention such as the text processor, data store, and possibly also the audio signal processor may be distributed or configured in a different manner

5   in order to provide alternative implementations.

CLAIMS

1. A telecommunications services apparatus for use in operative association with a telecommunications system, said telecommunications system having a plurality of communications terminals which provide a facility for telecommunications, said telecommunications apparatus comprising

- a text processor coupled to said telecommunications system and also coupled to an associated data store which has stored therein information capable of association with data entered from a communications terminal and so organised that in response to data entered from a communications terminal the text processor will return the associated information from the data store to the said communications terminal and/or to another selected communications terminal.

2. A telecommunications services apparatus as claimed in Claim 1 including a plurality of data stores.

3. A telecommunications services apparatus as claimed in Claim 2 wherein access to one of said data stores is restricted to a closed user group of communications terminals.

4. A telecommunications services apparatus as claimed in any preceding claim whereby an internet is operable so as to provide said data store or one of said data stores.

5. A telecommunications services apparatus as claimed in any preceding claim comprising an audio signal processor coupled to the text processor whereby said retrieved information includes data representative of audio signals wherein said audio signal processor operates to generate and deliver audio information.

6. A telecommunications services apparatus as claimed in Claim 5, wherein said audio information is delivered to said communications terminal.

7.   A telecommunications services apparatus as claimed in Claim 5, wherein said audio information is delivered to another selected communications terminal.

8.   A telecommunications services apparatus as claimed in any preceding claim wherein the telecommunications system is a mobile telephone network.

9.   A telecommunications services apparatus as claimed in any preceding claim wherein the information sent to and from the text processor is in short message service (SMS) form.

INTERNATIONAL SEARCH REPORT
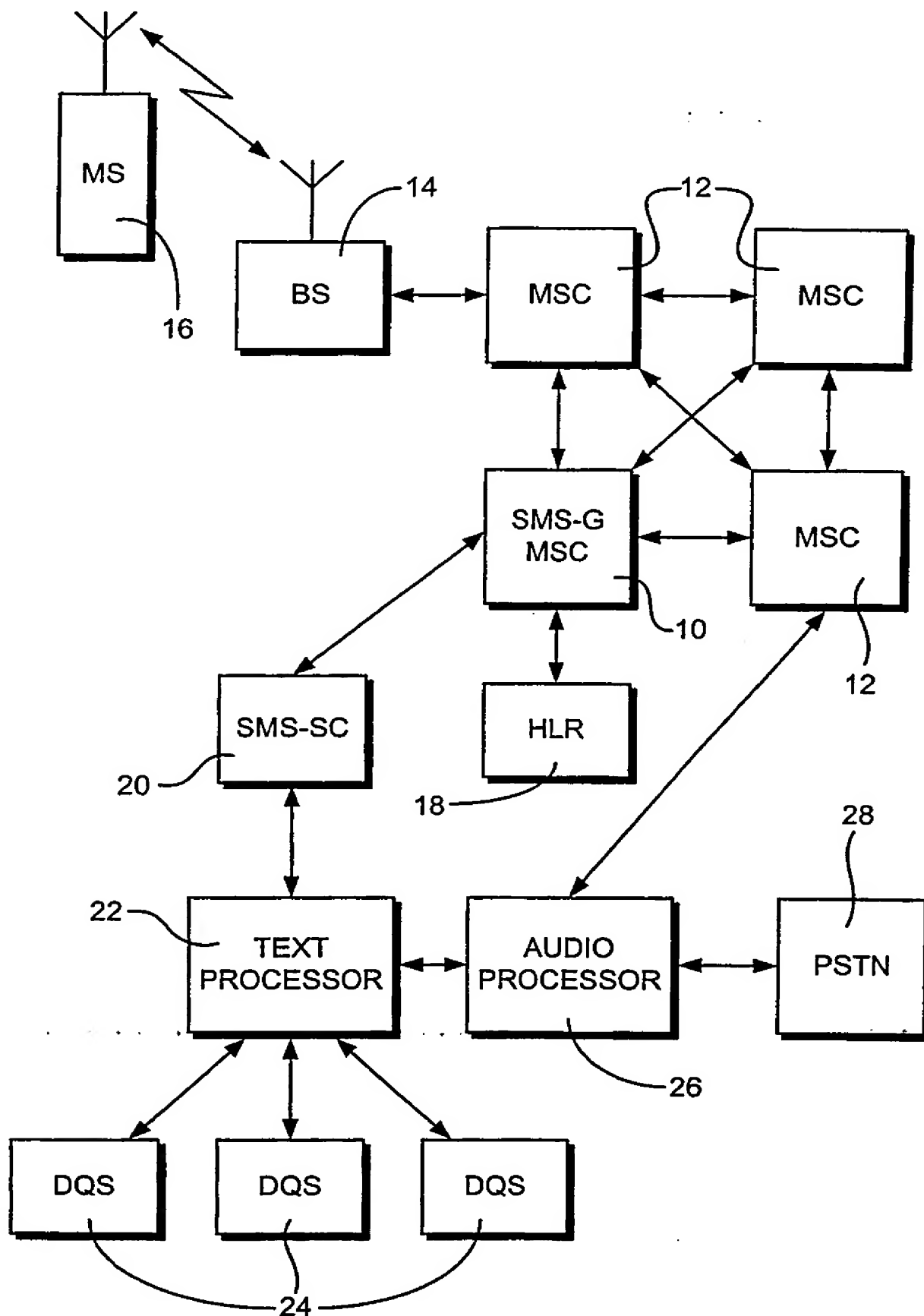
Inter   )nal Application No

PCT/GB 00/02919

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7   H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, IBM-TDB, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 926 911 A (IBM CORP) 30 June 1999 (1999-06-30) abstract column 2, line 29-47 column 4, line 54 -column 5, line 12 claims 1-3,9,14; figures 1,2	1,5,6,8, 9
Y		7
A		2-4
Y	EP 0 869 688 A (NOKIA MOBILE PHONES LTD) 7 October 1998 (1998-10-07) abstract column 5, line 27-44 figures 1,2	7
X	WO 98 11744 A (NOKIA TELECOMMUNICATIONS OY) 19 March 1998 (1998-03-19) the whole document	1,4,8,9

-/--

[X] Further documents are listed in the continuation of box C.   [X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 October 2000	07/11/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Gijsels, W

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 19480 A (ERICSSON INC) 7 May 1998 (1998-05-07) abstract page 2, line 8-32 claims 1,3,7; figures 1,4	1,5,6,8,9
X	WO 98 21913 A (ERICSSON INC) 22 May 1998 (1998-05-22) abstract page 2, line 36 -page 5, line 3 claims 1,2,5-9; figures 1-3	1,2,8,9
X	WO 97 41654 A (TELEFON AB LM ERICSSON) 6 November 1997 (1997-11-06) abstract page 2, line 19 -page 3, line 25 claims 1,4,6,8,9; figures 1,2	1,8,9
P,X	WO 00 02403 A (SENDIT AB) 13 January 2000 (2000-01-13) abstract page 1, line 12 -page 4, line 21 claims 1-5,7,8; figures 1-4	1,4,8,9
P,X	WO 00 28748 A (MANNESMANN AG) 18 May 2000 (2000-05-13) abstract page 1, line 13 -page 4, line 24 claims 1-3,5,6; figure 1	1,8,9

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0926911	A	30-06-1999	DE	19747438 A	06-05-1999
			CN	1215956 A	05-05-1999
			JP	11177699 A	02-07-1999
EP 0869688	A	07-10-1998	FI	971386 A	05-10-1998
WO 9811744	A	19-03-1998	FI	963659 A	17-03-1998
			AU	4304197 A	02-04-1998
			EP	0861565 A	02-09-1998
			JP	2000501270 T	02-02-2000
WO 9819480	A	07-05-1998	US	6018654 A	25-01-2000
			AU	724200 B	14-09-2000
			AU	5091498 A	22-05-1998
			BR	9712385 A	31-08-1999
			DE	19782072 T	25-11-1999
			FI	990961 A	28-06-1999
			GB	2333668 A	28-07-1999
WO 9821913	A	22-05-1998	US	5930699 A	27-07-1999
			AU	5105898 A	03-06-1998
			CN	1237315 A	01-12-1999
			EP	0940055 A	08-09-1999
WO 9741654	A	06-11-1997	AU	2375097 A	19-11-1997
			EP	0864211 A	16-09-1998
WO 0002403	A	13-01-2000	AU	5075499 A	24-01-2000
			SE	9802401 A	04-01-2000
WO 0028748	A	18-05-2000	DE	19852860 A	25-05-2000
			AU	1648000 A	29-05-2000